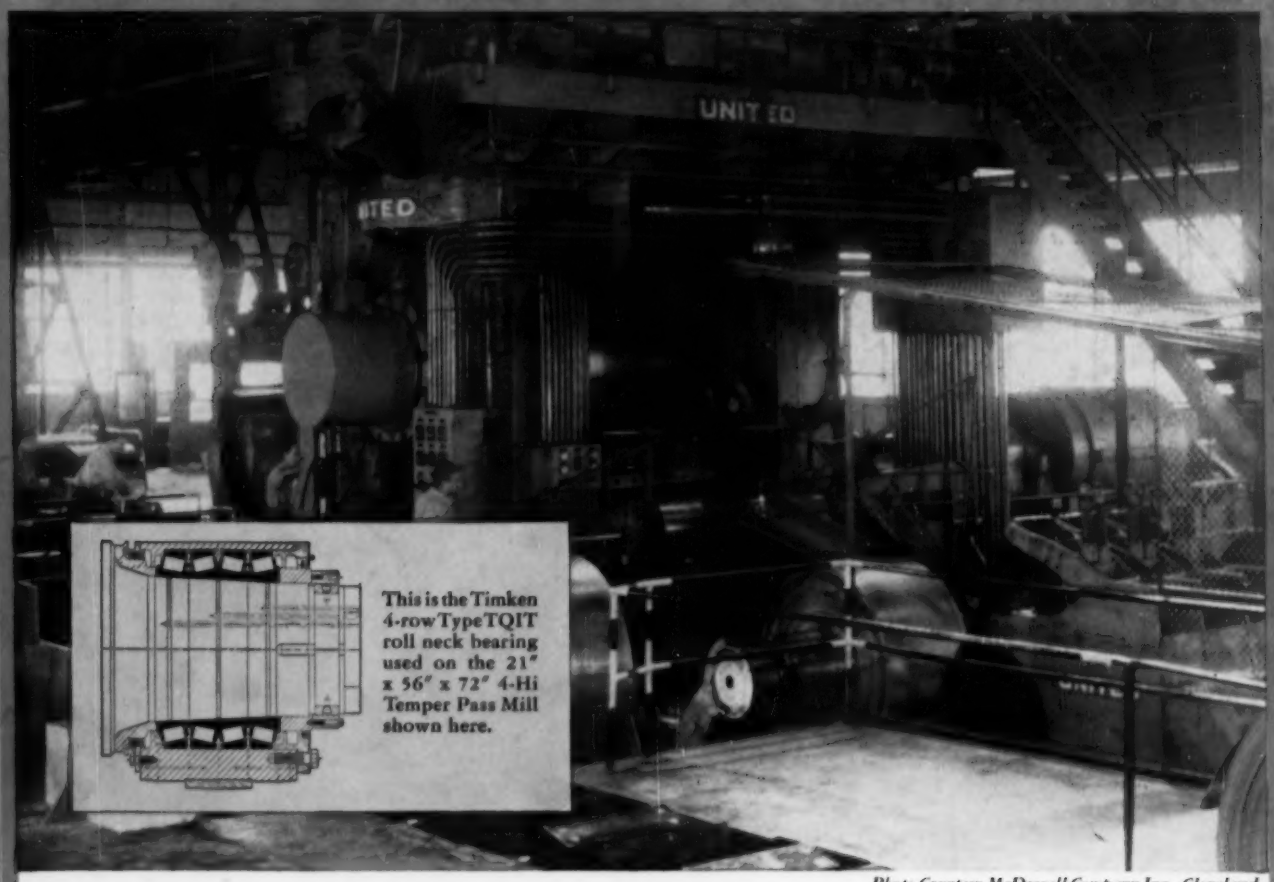
the Iron Age
A Chilton Publication
THE NATIONAL METALWORKING WEEKLY • FEBRUARY 3, 1955

How research can cut your paint bill
See page 67



This is the Timken 4-row Type TQIT roll neck bearing used on the 21″ x 56″ x 72″ 4-Hi Temper Pass Mill shown here.

Photo Courtesy McDowell Company Inc., Cleveland

New tapered bore TIMKEN® bearing in this new mill combines interference fit, easy removal

THE Timken® TQIT bearing is the world's first 4-row tapered roller bearing with a tapered bore. It combines maximum bearing capacity and interference fit with easy removal. Now in its second year of service on a midwestern steel company's new 21″ x 56″ x 72″, 4-Hi Temper Pass Mill, this Timken bearing has a bore of 32.625″, an O. D. of 45″, and a width of 32½″.

This bearing can be quickly removed from the roll neck by expanding its cones hydraulically. Excessive scuffing and neck wear are eliminated. The interference fit of the cone with the roll neck provides greater stability between the cone and the neck and gives better load distribution within the bearing. It also permits improved fillet contours and larger necks. Result: lower neck stress and deflections than any other arrangement.

Like other Timken roll neck bearings, the type TQIT eliminates the need for special thrust bearings and makes possible higher rolling mill speeds. Mills can be stopped and started without the loss of steel.

Make sure your roll neck bearings have the trade-mark "Timken." The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ont. Cable address: "TIMROSCO".

TIMKEN
TRADE-MARK REG. U. S. PAT. OFF.
TAPERED ROLLER BEARINGS

NOT JUST A BALL ○ NOT JUST A ROLLER ⬭ THE TIMKEN TAPERED ROLLER ⬭ BEARING TAKES RADIAL ⓡ AND THRUST —ⓣ— LOADS OR ANY COMBINATION ✳

NEW
Rotor B-35 Vertical Air Grinder
PAYS FOR ITSELF IN 14 WEEKS

Job: Grinding surface defects on castings. Formerly used 3600 rpm electric grinders.

Now: Rotor Application Engineer suggested switching to new Rotor B-35 Vertical Grinder at 6000 rpm with a harder wheel.

Results: Saves 8 minutes per casting . . . 40% more output with 60% use factor. Savings paid off tool in 14 weeks. Wheels last longer. Cuts operator fatigue.

See how *you* can step up output with new Rotor tools! Ask for demonstration on your job.

ASK FOR CATALOG No. 40

THE ROTOR TOOL CO.
CLEVELAND OHIO

the Iron Age
A Chilton Publication

DIGEST OF THE WEEK

Vol. 175, No. 5, February 3, 1955

Starred items are digested at the right

EDITORIAL
Every Businessman's Obligation 7

NEWS OF INDUSTRY
*Special Report: Aim Research at Paint Bills 67
*Financial: Steel Earnings Dip 9 Pct in '54 69
*International: British Auto Output Soars 71
*Interview: How You Can Cut Foundry Costs .. 72
*Construction: Equipment Sales Perk Up 74
*Expansion: U. S. May Ask Huge Titanium Boost 76
Management: Newport Opens New Cold Mill .. 78
Industrial Briefs 82
Personnel: Iron Age Salutes 97
Iron Age Introduces 99
Clearing House 196

NEWS ANALYSIS
Newsfront 65
Report to Management 81
*Automotive Assembly Line 84
This Week in Washington 89
West Coast Report 93
*Machine Tool High Spots 95

TECHNICAL ARTICLES
*Tube Forging Lowers Fabricating Costs 107
*Cold Cleaners Do Effective Job in Tanks 110
Tape Controlled Machines Do Fast Drilling 113
*Elevated Tank Designed to Take Atomic Blast . 114
*Ideas for Buying Electric Lift Trucks 116
*Tough Steel Parts Made From Powder Metal .. 119
Technical Briefs 132

MARKETS & PRICES
*The Iron Age Summary—Steel Outlook 175
*Steel Product Markets 176
Comparison of Prices 177
Iron and Steel Scrap Markets 178
*Nonferrous Markets 182
Steel Prices 184

REGULAR DEPARTMENTS
Dear Editor 9
Fatigue Cracks 11
Dates to Remember 13
Free Literature 124
New Equipment 167

INDEX OF ADVERTISERS 204

THE IRON AGE, published every Thursday by CHILTON CO. (INC.), Chestnut & 56th Sts., Philadelphia 39, Pa. Entered as second class matter, Nov. 8, 1932, at the Post Office at Philadelphia under the act of March 3, 1879. Price to the metalworking industries only, or to people actively engaged therein, $5 for 1 year, $8 for 2 years in the United States, its territories and Canada. All others $15 for 1 year; other Western Hemisphere countries, $15; other Foreign Countries, $25 per year. Single copies, 50¢. Annual Review Issue, $1.00. Cables: "Ironage," N. Y.

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NEWS DEVELOPMENTS

RESEARCH AIMS AT $2 BILLION PAINT TAB — P. 67
American industry picks up a staggering $2 billion tab each year for maintenance painting. The battle against corrosion is such a costly headache that many firms have set up their own research programs to evaluate hundreds of paint systems under conditions peculiar to their operations. One large chemical company has boosted the life of its average paint job from 1 to 3 years. This story reviews Jones & Laughlin's methods of testing about 50 systems.

STEEL COMPANY EARNINGS DIP 9 PCT IN 1954—P. 69
Though steel production last year was off more than 20 pct, net earnings of the industry slipped only 9 pct. Industrywide modernization during the past few years minimized the decline in earnings. Inland's net set a new company record. U. S. Steel announced a 2 for 1 stock split. And Bethlehem bared plans for a further $100 million expansion in finishing facilities at Sparrows Point.

BRITISH AUTO PRODUCTION IS SOARING — P. 71
Production of motor vehicles in Britain hit 1,038,834 units last year to set an alltime high. Half of this—$952 million worth—was exported. Plan increased output and spending.

WHAT YOU CAN DO TO CUT FOUNDRY COSTS — P. 72
Eugene M. Hinze, of Runge Foundry Cost Systems, tells what can be done to cut foundry costs. Interviewed by THE IRON AGE, Mr. Hinze said lack of proper costing and poor selling policy were the major failings in foundries. How you can tell whether your firm needs to change its methods.

AUTOMAKERS PLAN FEW '56 BODY CHANGES — P. 84
Large parts diemakers suffer slump after last year's boom in tooling up of major body changes throughout the industry. Producers of small parts are having busy season supplying components for style facelifts.

DODGE CHIEF WARNS AUTOMATION A MUST — P. 95
Dodge head W. C. Newberg says automation is an economic necessity for manufacturers today. Stressing benefits of uniform quality, increased production, space savings and safety, he says not to look for quick labor and cost cuts.

IN METALWORKING

ENGINEERING & PRODUCTION

TUBE FORGING CUTS COST ON HOLLOW PARTS—P. 107
Increased capacity for "tube forging" is widening its application in machine and structural parts. One important advantage is in shaping large, thick-walled tubes close to finished size requirements. Where applicable, it saves on material and metal removal costs.

NEW COLD CLEANERS DO AN EFFECTIVE JOB—P. 110
Two new cold cleaners, used in combination, effectively remove shop oil and dirt without producing toxic or disagreeable fumes. One cleaner is an active surface agent while the other improves cleaning action and acts as a rust preventive. Dirt removal is by emulsification and preferential wetting. Rinsing is not required. Simple agitation aids cleaning action.

TANK CAN WITHSTAND AN ATOMIC BLAST — P. 114
A newly designed 500,000 gal elevated tank can withstand an atomic blast equal to 20,000 tons of TNT at a ground zero distance of one-half mile. It has more and stronger columns, large sway rods and heavy base.

TIPS FOR ELECTRIC LIFT TRUCK BUYERS — P. 116
Specifying an electric lift truck for maximum efficiency and economy is often a problem. First rule for wise buying is: Don't buy a special type for each handling job. Look for basic equipment which will do most of your work, using other handling means for the remainder. Truck size, weight, capacity deserve study.

POWDERED STEEL PARTS MADE HARD, TOUGH—P. 119
Small, close-tolerance, highly stressed steel parts are now made by modern powder metallurgy techniques. High-density ratios are a key in making parts with high mechanical properties. Elongation, reduction in area and impact strength improve sharply at threshold density of about 97 pct. Gas carburizing and close control of mix put carbon where it is needed.

MARKETS & PRICES

EARTH MOVING EQUIPMENT SALES PERK UP — P. 74
Already-standing construction backlogs—which show no signs of abating in '55—boosted earth moving equipment sales late in '54. New 10-year highway program will double roadbuilding, boost equipment sales and steel needs further.

U. S. SEEKS HUGE TITANIUM EXPANSION — P. 76
Government action to step up titanium production and mill facilities is expected soon. Present 35,000-ton sponge goal will probably be upped to 50,000 or 100,000 tons. Already lagging mill capacity may be boosted to 100,000 tons. Scrap reuse, embrittlement problems must still be licked. May seek $1.4 billion titanium stockpile.

SURGE IN STEEL MARKET BROADENS — P. 175
The Formosa calculated risk policy has sparked what was already a strong steel market. Demand and order placing has broadened considerably in the past two weeks. More expansion in order books is a certainty in the coming weeks. At the rate new business is now being received it will not be long before items other than flatrolled will become "tight."

PIPELINE PROJECTS COULD BOOM PLATE — P. 176
Plate could blossom into a really strong product within a month or so. Linepipe demand is already being felt. Pacific Northwest and Trans-Canada pipeline projects will need 5000 miles of big pipe starting this spring and summer.

COPPER PRICE YIELDS TO PRESSURE, UP 3¢ — P. 182
Long-expected copper price hike materialized last week when Anaconda Copper Mining Co. lifted the price 3¢ to 33¢ per lb for electrolytic. Other producers, custom smelters followed soon. Scrap higher at all levels. Secondary and brass mill prices up.

NEXT WEEK:

STUDY POINTS WAY TO PREVENT GALLING, SEIZING
Galling and seizing of titanium, either in use or in machining and drawing operations have hindered application and ability to work the metal. Basic data gathered in a study point the way to new methods for protecting titanium and other metals from galling and seizing. Selection of metal pairs and hardness of the matrix supporting the film are important factors.

WAGE-HOUR LAW STILL CAUSING HEADACHES
Violations of the Wage-Hour Law are turning up in half the companies investigated. Minimum pay, exemptions, hourly rates and bonuses are common problem areas. Broad coverage includes most metalworking. This article, written by a former government wage-hour official, tells you what to watch out for; it points out where most violations occur.

CUT COSTS
with the
Fastest Carburizing
(AND CASE HARDENING)

PRODUCTION UP 350% IN
45% Less Floor Space!

Bearing races and thrust washers are carburized 0.065" case depth in 6 hours at 1700°F in two Ajax salt bath carburizing and tempering lines totaling 6 furnaces, and occupying 45% less space than 21 separate batch type furnaces previously used. Six men handle 3½ times as many races as were previously handled by twelve men.

Costs Cut 60%!

390 pounds of metal body screws per hour are case hardened (0.004" to 0.010") in a single Ajax salt bath furnace no larger than your desk. Bath working dimensions are 36" by 12" by 16". Only 15 to 35 minutes immersion at 1600°F are required — depending on desired case depth. Salt bath carburizing greatly reduced rejects and eliminated a pickling operation.

Tractor drive pinions are selectively carburized in this typical Ajax electric salt bath installation. By immersing only the gear in the bath, carburization is obtained where desired and the unheated portions remain unaffected.

Ajax electric salt bath liquid carburizing is the **fastest**, most **economical** method of producing a specified case depth.

Faster Heating . . . Closer Control—A closely controlled case of 0.040" can readily be produced in 2 hours at 1750°F.

Low Costs—*First cost is only 1/2 to 1/5 that of any other production carburizing system!* Much less floor is needed. Maintenance costs are low.

Less Distortion — Temperature uniformity (within 5°F) minimizes distortion . . . assures less finish grinding . . . permits more shallow case depths.

Extreme Flexibility and Simplicity—Several batches may be case hardened simultaneously —each to a different case depth.

Combines with Other Operations — Both carburizing and brazing can be done in one heating of the work. Carburizing can also be combined with martempering.

No "oxygenation" of the case —No pitting and spalling.

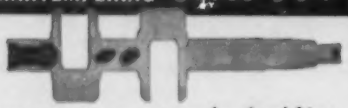
Selective Carburizing Simplified —Immerse only the portions of work to be treated, or copper plate the areas that do not require carburizing.

Eliminates Usual Reheating Operation—Work is quenched directly from carburizing bath.

Write for Catalog 116B and documented case histories of carburizing installations.

Send Your sample parts to the Ajax Metallurgical Service Laboratory for processing. No cost or obligation.

COMBINATION CARBURIZING-MARTEMPERING Saves 35%!



One operator runs a mechanized Ajax line that carburizes and martempers 65 outboard motor crankshafts per hour. Case depth of 0.040" is quickly obtained in a 1760°F bath. Besides an over-all savings of 35%, a copper plating operation and a straightening operation were eliminated. Rejects averaging 4% previously were practically eliminated.

Selectively CARBURIZED AND MARTEMPERED!

Only the teeth and internal spline of this AMS6260 gear are carburized to a 0.035 inch case with a 4½-5 hour immersion. Copper plating of the balance of the piece inhibits carburization. After carburizing and air cooling, gear is reheated and martempered at 500°F for 3½ minutes. Final hardness is Rc 62/63.

AJAX electric **SALT BATH** furnaces

HUTTGREN

Trademark

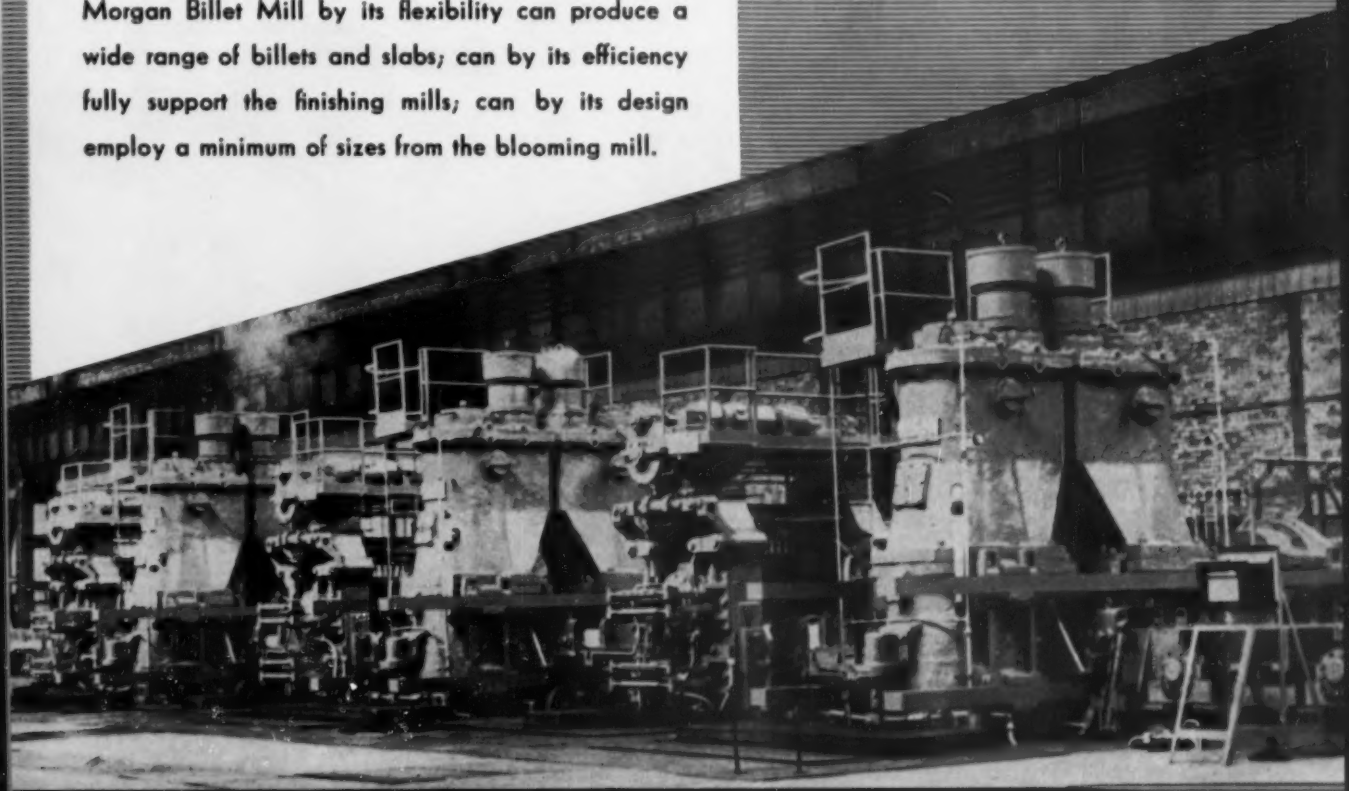
World's largest manufacturer of electric heat-treating furnaces exclusively

AJAX ELECTRIC COMPANY 904 Frankford Ave. **Philadelphia 23, Pa.**

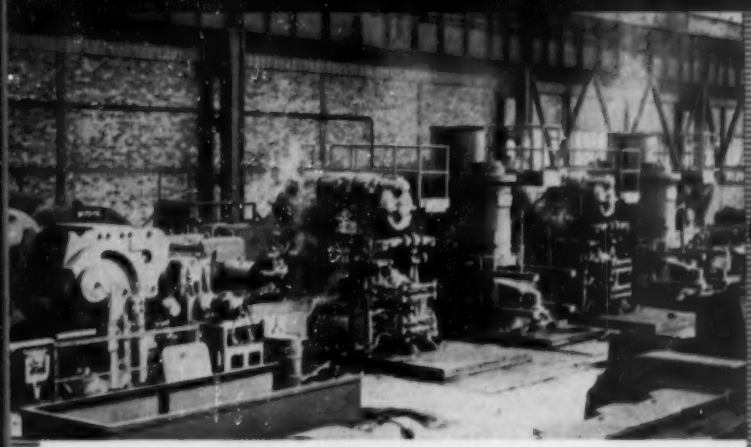
Associated Companies: Ajax Electric Furnace Corp. • Ajax Electrothermic Corp. • Ajax Engineering Corp.

Is Your BILLET MILL *the weak link?*

Rod, Merchant, Narrow Strip, and Skelp Mills all depend on the Billet Mill for steel — a Modern Morgan Billet Mill by its flexibility can produce a wide range of billets and slabs; can by its efficiency fully support the finishing mills; can by its design employ a minimum of sizes from the blooming mill.



At Consett Iron Works, Durham, England, a 6-Stand 30" Vertical-Horizontal Mill finishes larger sizes and also rolls Process Sections for



a 4-Stand 24" Vertical-Horizontal Mill which finishes the small sizes. A Morgan Electric Flying Shear divides the billets and slabs to accurate lengths . . .

RM-48

MORGAN CONSTRUCTION CO.
WORCESTER, MASSACHUSETTS
English Rep., International Construction Co., 56 Kingsway, London W. C. 2, Eng.

MORGAN
WORCESTER
ROLLING MILLS · MORGOIL BEARINGS
WIRE MILLS · GAS PRODUCERS · AIR EJECTORS
REGENERATIVE FURNACE CONTROL

NEW!

ARMCO ALUMINUM-COATED STEEL

for outdoor service

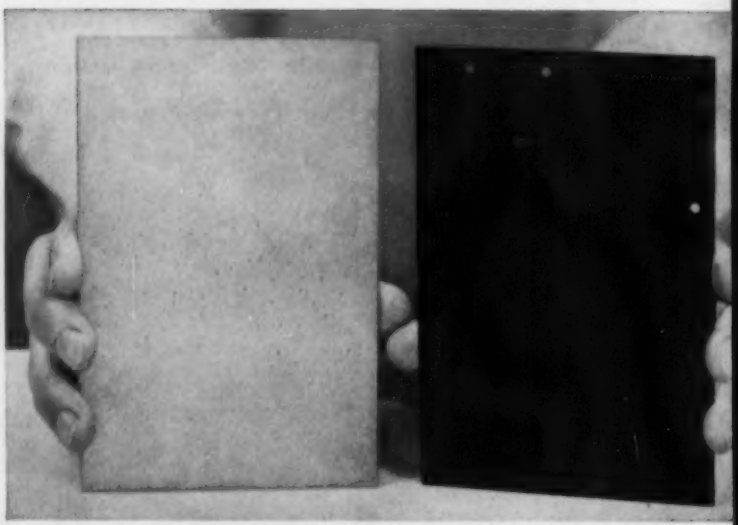
COMBINES CORROSION-RESISTING PROPERTIES OF ALUMINUM WITH STRENGTH OF STEEL

A new hot-dip aluminum-coated sheet steel—known as Armco ALUMINIZED STEEL® (Type 2)—is now in production after 15 years of corrosion testing. It combines the surface advantages of aluminum with the strength of steel.

While zinc coatings have done a good job of protecting steel against rust, tests indicate this new aluminum-coated steel is greatly superior. The 15-year tests in an industrial area show the atmospheric corrosion resistance of this aluminum coating is at least 3 times that of a standard coating on galvanized steel sheets.

During the past year and a half of field development work, ALUMINIZED STEEL (Type 2) has been used in prefabricated industrial, commercial and farm buildings, industrial rolling doors, covers for silos and water storage tanks, roof deck, and other applications under general atmospheric conditions.

The new sheet is a companion grade to Armco ALUMINIZED STEEL (Type 1) exclusively produced by Armco since 1939 for high temperature service.



In atmosphere sufficiently corrosive to cause a standard galvanized coating (right) to fail completely in 12 years, Armco ALUMINIZED STEEL (Type 2), left, looked like this after 15 years. Cleaned samples show the aluminum coating is still giving full protection to the base metal.

QUESTIONS YOU MAY WANT ANSWERED

DOES IT "WEATHER" LIKE ALUMINUM?

Yes. The surface of samples of Armco ALUMINIZED STEEL (Type 2) and aluminum, exposed to the atmosphere for five years, cannot be told apart.

WHAT IS ITS STRENGTH?

Because it has a steel base it has the strength and rigidity of steel . . . thus avoiding problems common to weaker materials.

DOES IT REFLECT HEAT?

Yes, ALUMINIZED STEEL (Type 2) offers the same high reflectivity of radiant heat as aluminum—whether from the sun or from low temperature heat sources.

DOES IT RESIST FIRE DAMAGE?

Armco ALUMINIZED STEEL has excellent resistance to fire damage. At 800 F, for example, it has more than ten times the strength of aluminum. Steel has a melting point of 2850 F; aluminum melts at about 1200 F.

WHAT ABOUT FABRICATION?

Armco ALUMINIZED STEEL (Type 2) withstands severe forming without peeling or flaking of the coating. It also can be embossed and spun, but is not recommended for drawing operations.

HOW DOES IT COMPARE IN COST?

Even when considering equal thicknesses, ALUMINIZED STEEL (Type 2) generally costs less per square foot than aluminum. Additional cost savings are possible because the greater strength of the steel base permits use of lighter gages. For example, a fabricator using .050 aluminum could save 40 to 50 per cent of material costs by utilizing the proper gage of ALUMINIZED STEEL.

While the initial cost is somewhat higher than galvanized steel, it is less than the cost of galvanized plus one field coat of paint. Because of its superior atmospheric corrosion resistance, the new aluminum-coated steel needs no paint protection.

If you would like complete information on sizes, gages and prices of Armco ALUMINIZED STEEL (Type 2), just fill in and mail the coupon.

ARMCO STEEL CORPORATION

955 Curtis Street, Middletown, Ohio

Sheffield Steel Division • Armco Drainage & Metal Products, Inc. • The Armco International Corporation

ARMCO

ARMCO STEEL CORPORATION

955 Curtis Street, Middletown, Ohio

What are sizes, gages and prices of Armco ALUMINIZED STEEL (Type 2)?

We manufacture _____

_____

NAME _____

TITLE _____

COMPANY _____

STREET _____

CITY _____ ZONE _____ STATE _____

The Iron Age

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Indexed in the Industrial Arts Index and the Engineering Index.

EPA NBP

Editorial:

Every Businessman's Obligation

NOW that we have told the Chinese Reds where the line is drawn, there are other serious matters to consider. They concern industry and its managers.

Our decision to stop Communist nibbling in the Far East is a calculated risk taken on behalf of peace. But we may have to fight for that peace. If we are not forced to fight we have to be ready to back up our words on an instant's notice. Communist behavior in the past should have taught us this lesson.

We are now heading into a strong recovery from a mild recession. This movement may assume boom proportions before we go into 1956. The current Far Eastern situation may intensify greatly the recovery picture. The psychology is there—it may exert its influence.

Anything which would contribute to runaway price and materials markets will increase clamor for government controls. We almost had them before the Indo-China debacle. We could have them quickly if present international events should produce severe industrial market and price dislocations.

Because of this sensitive condition, it is now a businessman's obligation to:

- Buy far enough ahead to meet adequately his real needs; but not far enough ahead to contribute to industrial hysteria.
- Keep his defense commitments in tip-top shape making sure that there is no backsliding on this type of business.
- Encourage moderation—but good foresight—in inventory building and hedge purchasing so that no serious bottlenecks develop.
- Prove—by action—that controls on business are not the way to win a peace or to hold the Reds in check.
- Be cautious and level-headed about price increases which may be necessary. Be sure such increases cover only proper advances in labor and material costs.
- Show that there is nothing wrong in actively displaying honest and sincere patriotism—of the kind which made this country great.

The government and the people always watch industry closely in an emergency. Good examples are worth a barrel of words or good intentions.

Tom Campbell

EDITOR

Fork truck with built-in lasso ... for cowboy drivers

● Over-enthusiastic truck jockeys can't hurt Baker Fork Trucks or loads carried (or themselves) by jumping from "low" to "high" or forward to reverse.

Baker drum-type controllers take motor speed in successive steps through acceleration stages, no matter how "heavy" the foot on the accelerator.

Jack-rabbit starts, with resulting motor burnouts, are impossible. Dynamic braking slows truck to a smooth stop, sparing driver and load, and acts as auxiliary brake on steep grades.

Motor strain or jolt from sudden direction changes is prevented by requiring truck to come to a virtual stop before reversing circuit applies.

All this adds up to safer operation for driver, truck and load, less down time, lower repair bills and longer truck life.

For more detailed information on Baker Fork Truck features, write for 4-color sketch book —Bulletin 64. The BAKER-RAULANG Company, 1227 West 80th Street, Cleveland 2, Ohio.

Baker.
industrial trucks

dear editor: *letters from readers*

Annual Review

Sir:

Congratulations on an *excellent!!* job on the Annual. Easily worth more than full subscription cost alone. *Ray Anderson, Chief Inspector, Globe-Union, Inc., Milwaukee.*

Sir:

The Jan. 6th Review and Forecast Issue was a dandy throughout and worth filing on the top reference shelf. *A. L. Raich, Colorado Fuel & Iron Corp., Pueblo, Colo.*

How Not To Be Caught

Sir:

We would like to secure about 12 copies of your fine editorial appearing in the Jan. 13 issue, providing such copies are available.

It's needless to say that we enjoy THE IRON AGE and follow it very closely. It's the best in the field. *Frank Arlen, Century Metal Products Co., Plymouth, Mich.*

Aluminum Uses

Sir:

I have read with a great deal of interest the articles "Surface Treatment, Improved Properties, Broaden Uses of Aluminum" by C. C. Cohn which appeared in the Dec. 16 and Dec. 23 issues. I would appreciate it very much if you could send me two tear sheets of each article. *C. H. E. Beck, Chief Standards Engineer, Gilfillan Bros., Inc., Los Angeles.*

New Stainless Alloy

Sir:

May we have your permission to reproduce, for use by our salesmen, the article entitled "New Stainless Alloy Bridges Gap Between 300 and 400 Series?" This appeared in the Dec. 2 issue of THE IRON AGE.

We have already secured permission from Allegheny-Ludlum and would now like your okay to reproduce on our own multilith equipment from your pages. *E. F. Kay, Advertising Dept., Joseph T. Ryerson & Son., Inc., Chicago.*

Stainless Steels

Sir:

I just noticed the article, "Metals and Alloys" beginning on p. 172 of your Jan. 6 issue.

In the third paragraph PH stainless steels are mentioned twice. I wonder whether the writer knew that "PH" is part of two proprietary trade names, which in full are Armco 17-7 PH Stainless Steel and Armco 17-4 PH Stainless Steel. PH used alone is a deviation from proper trade name usage. *W. E. McFee, Product Information Service, Armco Steel Corp., Middletown, O.*

Coating for Metals

Sir:

We would like very much to know the name of the manufacturer of the water-displacing and oxide inhibiting coating for copper, brass and silver announced under Newsfront of the Jan. 20 issue. *J. M. Hourihan, Production Engineering Dept., Radio-Television Div., Stromberg-Carlson Co., Rochester, N. Y.*

Further information may be obtained from the London Chemical Co., Inc., 1535 N. 31st Ave., Melrose Park, Ill.—Ed.

Pilot Plant Coke Oven

Sir:

We would appreciate it very much if you would kindly send us a dozen or so tear sheets of the following article that appeared in the Dec. 2 issue: "Pilot Plant Coke Oven Gives Researchers New Tool of Advance Design" by John Mitchell. *Grace Johanson, Eastern Gas & Fuel Associates, Boston.*

It Outthrows 'Em All—*IN THE LIMESTONE LEAGUE!*

RUBBER-ARMED PITCHERS are much more common in industry than in the big leagues. They are a special kind of conveyor belt that travels at high speed and throws, not curve balls or sliders, but a variety of bulk materials from one point to another.

One such thrower, however, was a definite curve ball to its owners. It was used to bulk-load boxcars with hot, crushed limestone at the rate of 2500 tons per month. The trouble was no belt could stand up under the excessive dust, heat and abrasion for much more than *two months*. Finally they called in the G.T.M.—Goodyear Technical Man—who recommended a belt designed for the job.

The G.T.M.'s belt served up *27,500 tons* before retiring—threw *more than five times as much* limestone as previous belts. And it ran much truer—cut training and maintenance to the bone. How can the G.T.M. help you with your conveyor belt problem? You can contact him through your Goodyear Distributor or Goodyear, Industrial Products Div., Akron 16, Ohio.

CONVEYOR BELTS by

GOODYEAR

THE GREATEST NAME IN RUBBER

fatigue cracks

by William M. Coffey

WANTED

**The earliest issues of The Iron Age—
first published in 1855—
still in existence in this country.**

$500.00 REWARD

**Will be paid for the issue
with the oldest dateline.**

IDENTIFYING MARKS

The issue of The Iron Age shown above is one of the earliest copies still on file at the publication's offices. Older copies may have similar characteristics.

LAST SEEN

Behind a trunk in a dusty attic – under the eaves in a warehouse – in the dark basement of an ancient iron works?

On this, the occasion of its

100th ANNIVERSARY

The IRON AGE... America's leading metalworking magazine wishes to see...

JUSTICE DONE

The missing issues create a gap – an awkward absence of limbs on the family tree. Somewhere they must still exist. To bring them out of hiding The Iron Age makes this legitimate offer:

A reward of $500 will be paid to the person who submits the copy of The Iron Age with the *oldest* dateline. $100 will be paid for the copy with the *second oldest* dateline. For all other issues submitted, dated between 1855 and 1900, a copy of the centennial issue of The Iron Age, "100 Years of Metalworking", to be published June, 1955, will be awarded.

How to Collect Your Reward—

Address entries to the Publisher, THE IRON AGE, 100 East 42nd St., New York 17, N. Y. Don't send original copies—just mail a statement of proof. Photostats or photographs of the front cover will be acceptable.

This isn't a complete set of rules. If you want details on duplicate entries, who owns the winning issues, judges, etc., we suggest you write us on your letterhead.

So how about looking around? Somebody has to win!

dates to remember

FEBRUARY

AMERICAN INSTITUTE OF MINING & METALLURGICAL ENGINEERS—Annual meeting, Feb. 14-17, Conrad Hilton Hotel, Chicago. Institute headquarters are at 29 W. 39th St., New York.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS — Founding Anniversary meeting, Feb. 16, New York. Society headquarters are at 29 W. 39th St., New York.

DROP FORGING ASSN.—Winter Industry meeting, Feb. 17-18, Statler Hotel, New York. Association headquarters are at 605 Hanna Bldg., Cleveland.

EXPOSITIONS

NATIONAL ASSN. OF CORROSION ENGINEERS—Annual meeting and Show, Mar. 7-11, Palmer House, Chicago. Association headquarters are at 1061 M & M Bldg., Houston.

AMERICAN SOCIETY FOR METALS—Western Metal Exposition and Congress, Mar. 28-Apr. 1, Pan Pacific Auditorium, Los Angeles. Society headquarters are at 7201 Euclid Ave., Cleveland.

NATIONAL MACHINE TOOL BUILDERS' ASSN.—Machine Tool Show, Sept. 6-17, International Amphitheatre, Chicago. Association headquarters are at 2071 E. 102nd St., Cleveland.

MARCH

PORCELAIN ENAMEL INSTITUTE—Pacific Coast conference, Mar. 10-11, Biltmore Hotel, Los Angeles. Institute headquarters are at Dupont Circle Bldg., 1346 Connecticut Ave., N. W., Washington, D. C.

STEEL FOUNDERS' SOCIETY OF AMERICA—Annual meeting, Mar. 14-15, Drake Hotel, Chicago. Society headquarters are at 920 Midland Bldg., Cleveland.

AMERICAN SOCIETY OF TOOL ENGINEERS—Annual meeting, Mar. 14-18, Shrine Auditorium and Exposition Hall, Los Angeles. Society headquarters are 10700 Puritan Ave., Detroit.

NATIONAL ASSN. OF WASTE MATERIAL DEALERS, INC.—Annual convention, Mar. 20-22, The Conrad Hilton Hotel, Chicago. Association headquarters are at 271 Madison Ave., New York.

INTERNATIONAL ACETYLENE ASSN.—Annual spring convention, Mar. 23-24, Shamrock Hotel, Houston. Association headquarters are at 30 E. 42nd St., New York.

AMERICAN MACHINE TOOL DISTRIBUTORS ASSN.—Spring meeting, Mar. 25-26, The Greenbrier, White Sulphur Springs, West Va. Association headquarters are at 1900 Arch St., Philadelphia.

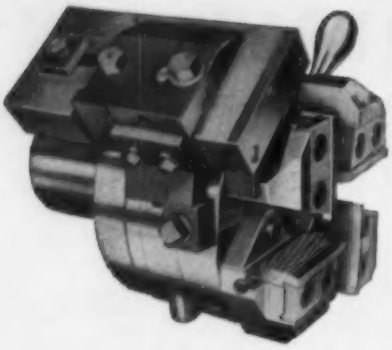
STEEL SHIPPING CONTAINER INSTITUTE, INC.—Annual meeting, Mar. 29-31, Biltmore Hotel, Palm Beach, Fla. Institute headquarters are at 600 Fifth Ave., New York.

APRIL

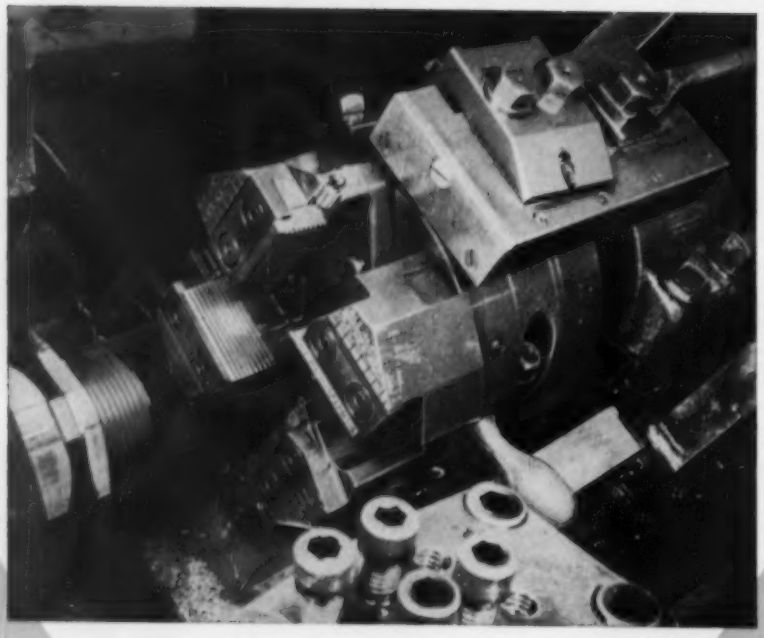
AMERICAN HARDWARE MANUFACTURERS ASSN.—Spring meeting, Apr. 10-14, Palm Beach Fla. Association headquarters are at 342 Madison Ave., New York.

WIRE REINFORCEMENT INSTITUTE, INC. — Spring meeting, Apr. 11, The Greenbrier Hotel, White Sulphur Springs, W. Va. Institute headquarters are at National Press Bldg., Washington, D. C.

CONCRETE REINFORCING STEEL INSTITUTE—Annual meeting, Apr. 11-16, The Greenbrier Hotel, White Sulphur Springs, W. Va. Institute headquarters are at 38 S. Dearborn St., Chicago.



STAINLESS STEEL



TAPERED THREADS

cut with Better Finish
Longer Tool Life

1½" Tapered Pipe Threads are cut in 304 stainless steel reducing bushings at Camden Machine Company, New Haven, Conn. These threads are produced by a 1¼" LANDMATIC Taper Attachment Head on a 3¼" Gridley single-spindle automatic at 15 surface feet per minute.

The thread finish is greatly improved from previous methods and 1000 pieces are completed between chaser grinds—an increase of more than 10 times.

These improved results can be entirely attributed to the use of the Taper Attachment and the free cutting action of the Landis Tangential Chaser. In operation, as the die head advances onto the workpiece, the movement of the die head cam along the cam follower of the taper attachment expands the chasers on diameter. This produces a tapered thread corresponding to the taper of the cam follower. Cutting action is limited to the throat section or chamfer of the chaser, allowing the thread to be cut quickly with little "cold-working." This action reduces cutting strains to a minimum and results in uniform tapered threads.

LANDIS Taper Attachment Heads are stationary self-opening heads for cutting tapered threads of all types. Six sizes of heads thread all diameters from ¼" to 6".

When writing for additional information, ask for Bulletin F-90.

THE WORLD'S LARGEST MANUFACTURERS OF THREADING EQUIPMENT - CUTTING - TAPPING - GRINDING - ROLLING

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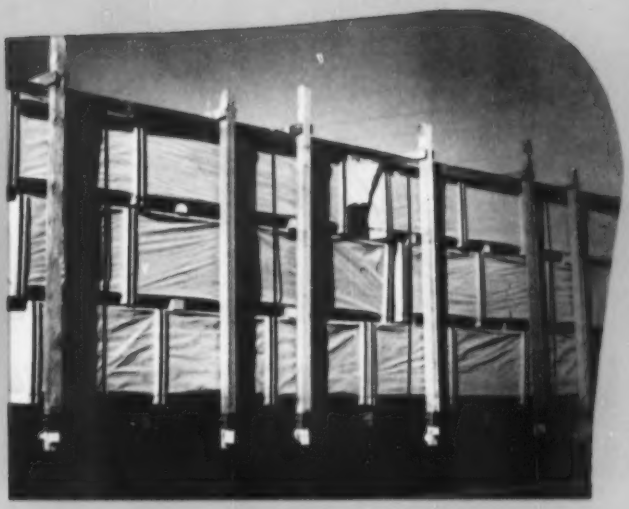

AIM* to speed carloading ...insure safe transit

Acme Steel Strapping *ideas in action* quickly demonstrate here what thousands of manufacturers are doing now to protect merchandise in transit. The rest of the story is told by the customer at the other end of the line who gets his shipments damage-free.

Regardless of how your product is shipped—skid, pallet, bundle, carload or carton—your *Acme Idea Man can show you how to use Acme Steel Strapping, Tools or Wire Stitching equipment effectively and economically. Get for yourself the multiple benefits of Acme Steel products and experience in packaging and shipping.

It will pay you to use the coupon on the reverse side . . . or call the nearest Acme Steel office for the services of an Acme Idea Man.

ACME STEEL PRODUCTS DIVISION—ACME STEEL COMPANY
2840 Archer Avenue, Chicago 8, Illinois

ask your *Acme Idea Man to help solve your problems

ACME STEEL

ask your Acme Idea Man to apply ideas like these to your shipping problems

Idea #417—Unitizing heavy, shaped timbers
Idea #127—Carloading mixed shipment of kegs and cases of beer
Idea #403—Assembling and stitching various size cartons
Idea #125—Reinforcement of crates for five-gallon water bottles
Idea #129—Skid loading printed material
Idea #416—Protection-line strapping of cartons
Idea #123—Self-palletizing unit of concrete block
Idea #131—Bundling refractory brick for palletless shipment
Idea #409—Strapping concrete pipe on flatcars
Idea #112—Strapping foundry flasks into bundles
Idea #418—Wire stitching of fibreboard tote boxes
Idea #402—Strapping rolls of tire cord fabric for overseas shipping
Idea #110—Strapping rubber onto skids, into palletless units, and carloads
Idea #109—Bundling and truck loading beehives
Idea #133—Tying protective wrappings to oxygen cylinders
Idea #408—Packaging of impregnated pipe
Idea #107—Carload bracing coiled copper rod
Idea #108—Skid loading cellophane rolls in cartons
Idea #111—Bundling solid fibre newsprint cores
Idea #105—Palletizing and carload bracing multi-packs of television tubes
Idea #401—Unitizing lumber for retail delivery
Idea #415—Strapping formed, wood pipe staves in carload shipments
Idea #104—Palletizing and carloading wax slabs

ABOVE: Acme Steel Silverstitcher closes and protects carton and contents. Ask your Acme Idea Man about new "Arcuate" Wire Stitching methods.

BELOW: Lumber is bundled and protected for easy, safe delivery. Your Acme Idea Man can recommend correct tools and steel strap sizes for any product handling.

SEND FOR THESE VALUABLE CATALOGS

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Please send me further information on Acme Steel's Safe, Lower-Cost Shipping Methods. I am interested in ☐ Steel Strapping; ☐ Wire Stitching; ☐ having an Acme Idea Man call on me.

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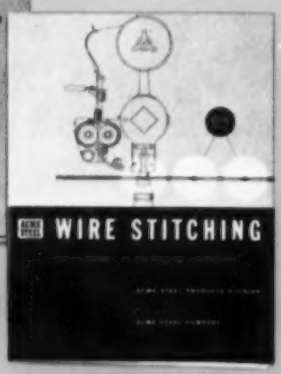

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ACME STEEL

Printed in U. S. A.—A-9779

What a 26 TON DIE BLOCK means to you!

Actually weighing 52,980 pounds with dimensions 25″ x 48″ x 156″, the die block shown above was one of eight which were made for forging aircraft parts. All of the dies are still producing close dimensional forgings.

What does that mean to you? It means that you can place absolute confidence in the workmanship and materials that go into any Finkl product whether large or small. To make a die block or forging of this size and quality requires the utmost skill and knowledge of steel and its characteristics. This is apparent in every phase of the operation from our own electric steel furnaces through forging, heat treating, machining and inspection.

For 75 years Finkl has been proving that the best is the least costly in the long run by manufacturing only the finest in forgings and die blocks. Call one of the offices listed below the next time you are considering die blocks or forgings. There is no obligation and should you choose Finkl, you will choose the best.

Write for this free catalog telling all about Finkl die blocks and forgings, the types of steel, the proper selection for the job, how to make dies last longer, and many other helpful facts. Please send request on your company's letterhead.

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50 THROUGH 300-TON CAPACITIES

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America's Most Complete Line of Presses, Shears, Machines and Tools for Plate and Sheet Metal Work

For a realistic answer to the metal stamping and forming problems of today... and tomorrow

DESIGN MODERNIZATION CONCEALS DRIVING MECHANISM

Fully streamlined, enclosed construction, front and back, provides pronounced advantages. There are no exposed, overhanging flywheel, clutch, brake, intermediate shaft, nor motor in rear of press to obstruct crane service, block light, throw grease and consume floor space unnecessarily ... yet all parts are quickly accessible.

WORK-SAVING FLEXIBILITY MEETS SHIFTING PRODUCTION NEEDS

Box type welded steel slides are power adjusted through self-locking, worm driven, barrel type connections to accommodate a wide range of die heights and to permit quicker, easier and safer die setting. Niagara electric clutch control provides trouble-free push button operation and a five-position selector switch for ease, safety and efficiency in single stroking, continuous running, jogging, reverse jogging and slide adjustment.

RUGGED, HEAVY DUTY FRAMES PROLONG DIE LIFE

All-steel, rigidly constructed frames, featuring an exclusive triple box section design, provide maximum resistance to deflection from horizontal, diagonal and torsional stresses. Greater accuracy and longer die life are thereby assured.

GREAT SHUT HEIGHT AND LONG SLIDE ADJUSTMENT

Unusually liberal shut height and extremely long slide adjustment, of both one and four-piece frame construction, permit use of a tremendous range of stamping and forming dies.

Hailed as the most progressive step in straight side, double crank press history, the new Niagara SC-2 Press Series could only have originated from a keen insight of today's metal working problems and the more challenging ones of tomorrow. In every detail of design, you'll recognize the unduplicated competence of Niagara engineers. Who else would be more mindful of press users' needs than the men who design and build America's leading and most complete line of presses, press brakes, shears, other machines and tools for plate and sheet metal work?

CHECK THE FEATURE-BY-FEATURE EVIDENCE

Preview this complete new line of straight side presses at once. Find out what they can do for you. Write for Niagara's new, illustrated Bulletin 64-H today.

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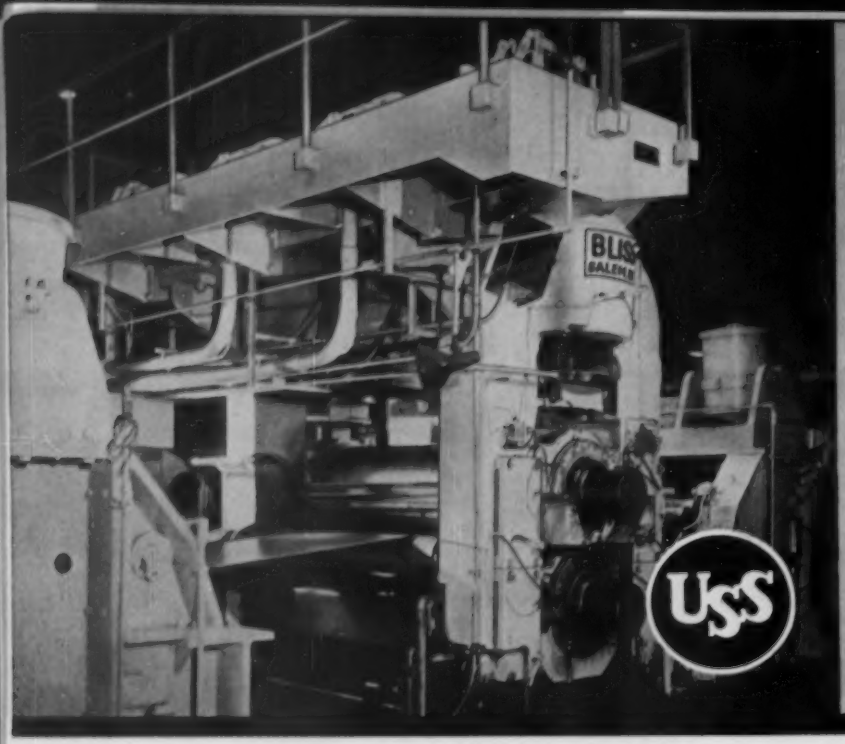


"We want a faster pickle line"

This Bliss 32" x 80" Two-High temper mill at the entry end of the Fairless Works pickle line is new and unique to the steel industry. It reduces strip slightly (2 to 3% elongation) and pulverizes skin-tight oxides. Pickling acids attack surfaces faster, speeding the entire operation and making better, more uniform pickling possible. For the Fairless Works, Bliss also designed, built and installed an automatic 19" x 53" x 48" Two-Stand tin temper mill (needs only 3 men to operate it) and another 32" x 80" Two-High mill that eliminates an extra handling operation in tempering and flattening strip prior to shearing or slitting.

When you think of ROLLING MILLS— think of BLISS!

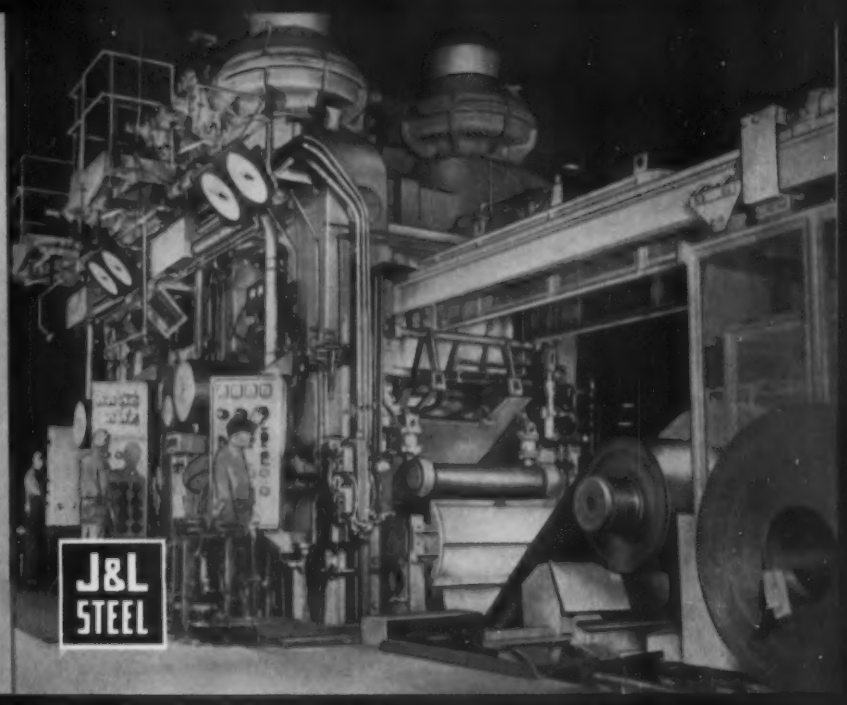
Here's the story of four who did

"Versatility . . . sheet-stock now, tinplate later"

At Pittsburgh Steel, this giant Four-Stand cold mill handles widths from 20 to 60 ins., thicknesses from tinplate to 16 gage. With its heavy housings it can also be set up to roll stainless. X-ray equipment spots variations in thickness as small as .0005" to permit immediate corrections. Other electronic devices control tension, shape and finish. Automatic coil handling equipment and the latest safety devices are used throughout. Bliss also installed a Four-High temper mill and a Two-High skin pass mill at the same Allenport, Pa. plant.

"We want speed throughout... in the mill and on coil handling, too"

By rolling more than 6000 fpm, this Bliss Two-Stand tin temper mill at Jones and Laughlin is one of today's fastest. These mile-a-minute speeds, though, called for a number of Bliss-developed design precautions: dynamic balancing of all rotating parts, gear-type couplings to assure uniform angular velocities. Moreover, semi-automatic terminal and auxiliary equipment—designed for extra large coils and quick strip threading—mean longer contact time, shorter loading periods and greater tonnage all along the line. Fast, reliable, safe, this Bliss mill is capable of better quality at higher speeds with easier control.



Whatever your problem in mills and accessories—speed . . . versatility . . . accuracy . . . in hot or cold rolling...ferrous or non-ferrous applications—whenever you think of rolling mills, think of BLISS.

For more information about others who thought of Bliss—for rolling mills and accessories—write today for Catalog 40-A. This 60-page brochure describes Bliss mill installations, terminal and auxiliary equipment.

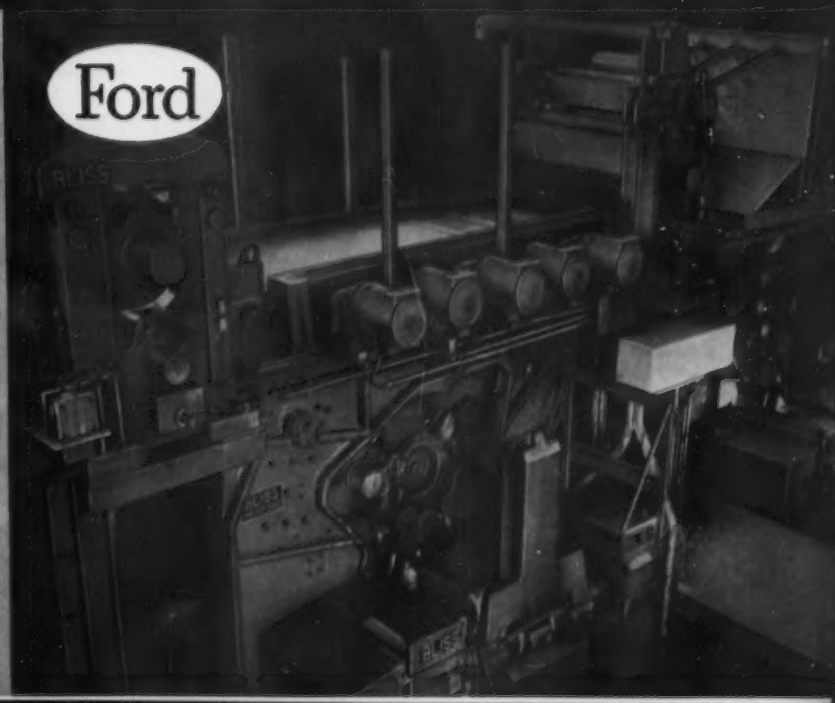
E. W. BLISS COMPANY, General Office: Canton, Ohio
ROLLING MILL DIVISION: SALEM, OHIO

BLISS
SINCE 1857

is more than a name...it's a guarantee

"Wind coils tight... and straight"

At River Rouge, this high-speed mandrel-type downcoiler by Bliss "rolls up" strip on an arbor with constant high-tension applied. Thus coils *are* tighter, more uniformly wound. Surfaces and edges are better protected, and better metallurgical characteristics are realized. After coiling, the mandrel collapses and facilitates coil stripping. Versatile, it handles a wide range of speeds, strip widths and gages. Bliss also designed and built a Four-High temper mill complete with heavy coil handling equipment for the Ford Motor Company.



The case of the

BEAUTIFUL FRAME

Handbag product of The Randolph-Rand Corporation, New Rochelle, New York.

A well-known handbag manufacturer who'd been having a problem getting a beautiful finish on brass frames at a low production cost called on Bridgeport's Technical Service for assistance.

Here's the case history: After careful study of his problem, a Bridgeport Fine Grain Brass — *custom made to the exact grain size best suited to the manufacturer's requirements* — was recommended. This vanity case quality metal was selected because the fine grain surface needs little finishing and the brass works well. Look at those 90° bends, for example, and notice how the brass is stiff enough to hold the cloth of the bag by itself.

By using Bridgeport Fine Grain Brass and improved techniques, a beautiful, lustrous finish was attained and *production per man in the finishing department increased five times.*

This is another case history to prove that *no single fine grain brass can do all jobs well.* A whole range of fine grain sizes is available, and since there is no one pat answer for all finishing problems, Bridgeport recommends the exact fine grain size only after consideration of all factors.

To find out how Bridgeport can help you improve your product and lower manufacturing costs with the right metal for your needs, call your nearest Bridgeport Sales Office.

Write for a free copy of Bridgeport's folder on Grain Size — "The Fourth Dimension."

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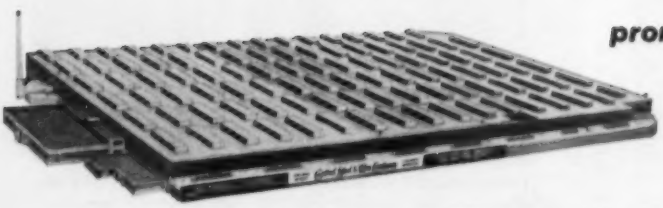
Stainless Steel Sheets...

immediately available in a wide range of analyses, sizes and finishes, cut to your specifications

prompt delivery



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STAINLESS STEEL TUBING IN ACID

the Weld is Corrosion Resistant!

Maybe you're one of the few people who hasn't fully accepted that idea up to now. Here's what we do to prove it.

We take a piece of standard Republic ELECTRUNITE Stainless Steel Tubing and put it into a 20 per cent hydrochloric acid solution. Then we let it boil.

When we take it out, the wall thickness has been reduced from .089 inches to .059 inches.

But the weld area is only reduced to .068 inches.

Proof: the weld area is not subject to preferential corrosion.

This is an accelerated lab test. We realize it's only one proof. But we also have on-the-job proof in chemical plants and refineries all over the country, where ELECTRUNITE welded stainless steel tubing is used. And processing corrosion is among the most severe.

The fact that we've been supplying electric resistance welded stainless steel tubing and pipe to process industries for the past twenty-five years means something for you. Find out exactly how much by calling your nearest Republic district sales office. Better yet, fill out and mail the coupon below.

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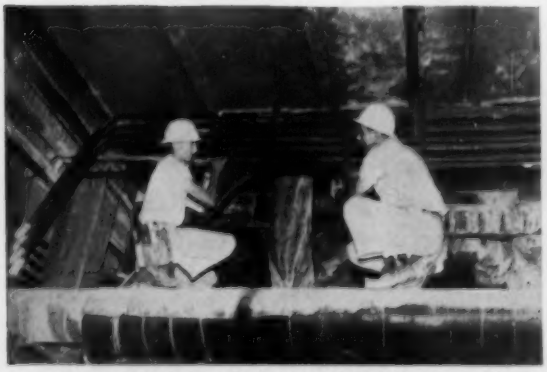
World's Widest Range of Standard Steels and Steel Products



IF YOU HAVE SEVERE CORROSIVE CONDITIONS like these at Kaiser Aluminum & Chemical Corp., Baton Rouge, La., Republic Dekoron-Coated Electrical Metallic Tubing or rigid steel conduit is the answer. This is galvanized steel with a coating of polyethylene, which gives electrical raceways double protection from end to end. Installation is easy. Connections between lengths are protected by vinyl or plastic tape.

YOUR PRODUCT CAN BE AS STRONG AS STEEL, yet weigh only 56 per cent as much. How? If it's made of Republic Titanium or Titanium Alloy. This high strength-to-weight metal, which is also unbelievably corrosion resistant, is now available in all commercial forms. And Republic has been working with it since 1948. We will tell you how and where to use it profitably. (Above: forged compressor rotor.)

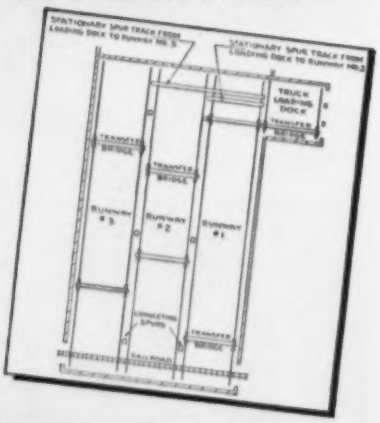
Heavy loads can be handled quickly and easily between all points in this large warehouse by the Cleveland Tramrail bridge system

LARGE TEXAS WAREHOUSE HAS *complete* TRAMRAIL COVERAGE

In the modern warehouse of the Metal Goods Corporation, Dallas, Texas, an extensive Cleveland Tramrail transfer bridge system provides overhead materials handling coverage for the entire floor area including the truck loading dock at the side of the building and a railroad spur at the end of the building. The system is so flexible that it not only can convey materials in several parts of the building at the same time, but it also can handle materials at trucks and railroad cars simultaneously.

Seven interlocking fully motorized push-button-operated floor-controlled bridges handle a vast variety of light metal plate, strips and shapes in this building which is one of the largest of its kind in the entire South.

More materials can be stored in this warehouse because they can be piled higher and far less aisle space is required.



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BOOKLET No. 2008. Packed with valuable information. Profusely illustrated. Write for free copy.

CLEVELAND TRAMRAIL DIVISION
THE CLEVELAND CRANE & ENGINEERING CO.
4840 EAST 284th ST. WICKLIFFE, OHIO

CLEVELAND TRAMRAIL
OVERHEAD MATERIALS HANDLING EQUIPMENT

Platypus
ORNITHORHYNCHUS ANATINUS

Versatile

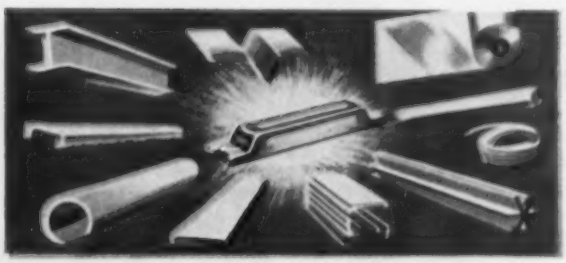
One of nature's most versatile creatures is the platypus, found in Australia.

This curious creature has the bill and broad webbed feet of a duck. It lays eggs that resemble the eggs of a reptile. The male can secrete a poison which is similar to that produced by a venomous snake. The body of the platypus is covered with fur as thick as that of an otter. It digs a den with a tunnel entrance under water and an air shaft on land. The platypus swims like a fish, yet suckles its young like a mammal.

One of industry's most versatile materials is aluminum. At an accelerating pace, industry is developing new fabricating methods for aluminum—methods never before used with structural metals. These new methods are being applied to economically fabricate products embodying aluminum's advantageous and versatile characteristics.

Today we have inexpensive aluminum collapsible tubes, light corrosion-resistant construction materials, low-resistance electrical conductors. Tomorrow, today's new fabricating techniques will provide rigid aluminum containers, more aluminum in transportation, in electrical equipment and in a multitude of other products.

Aluminium Limited Sales, Inc. is the distributor in the United States for aluminum from Canada. Why not investigate making your products of aluminum?



Versatile

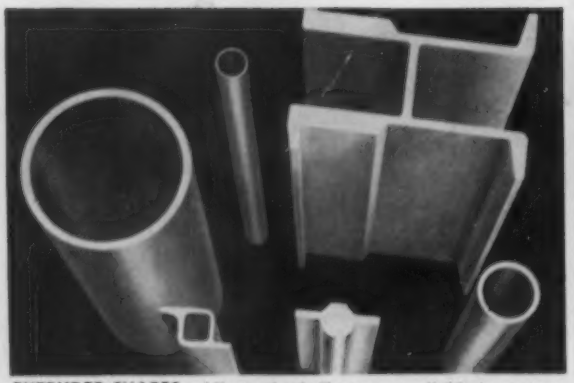
In the form of sheet, plate, tube, rod, pipe, wire, bar, extruded shapes, architectural and structural sections—aluminum is growing faster in number of uses than any other metal.

ALCAN
Aluminum *from* Canada

Aluminium Limited Sales, INC.
630 FIFTH AVENUE • NEW YORK 20, N. Y.

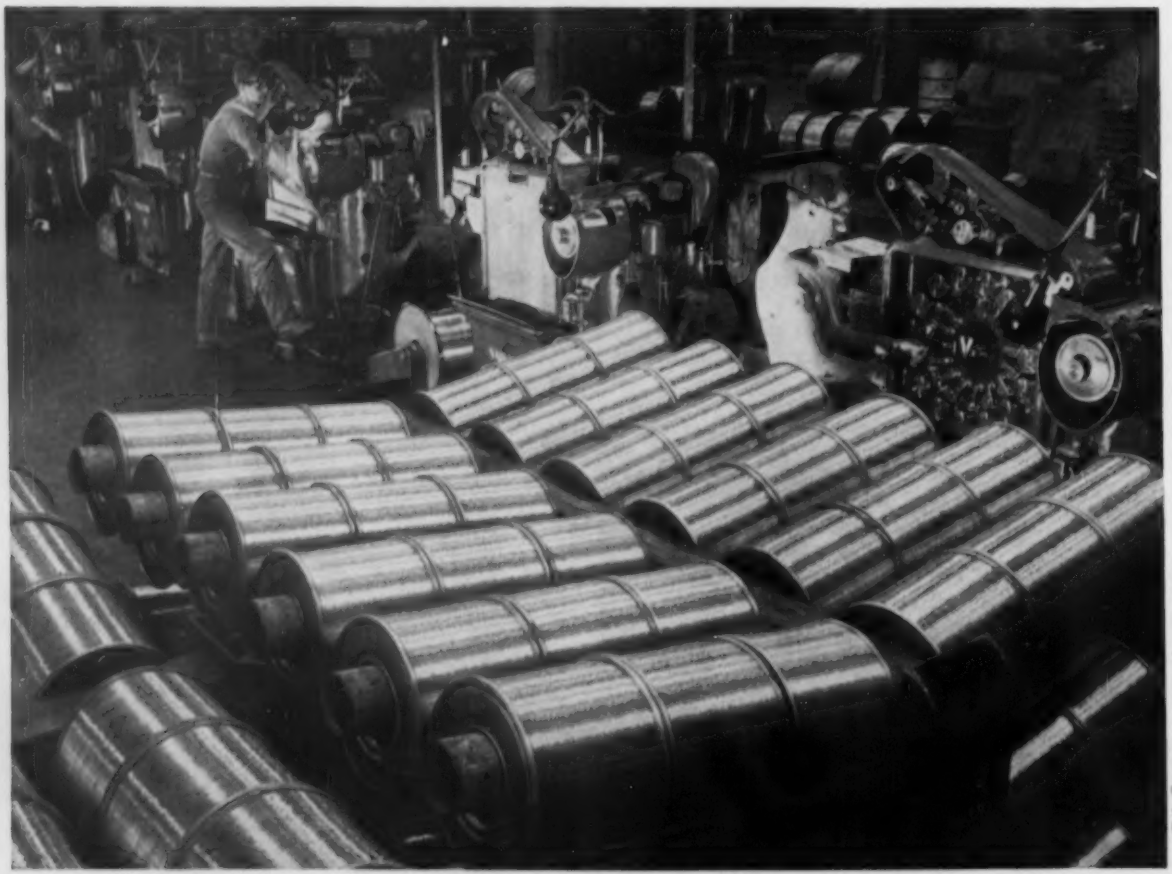
CLEVELAND • CHICAGO • DETROIT • LOS ANGELES • BUENOS AIRES • SÃO PAULO

Aluminum of



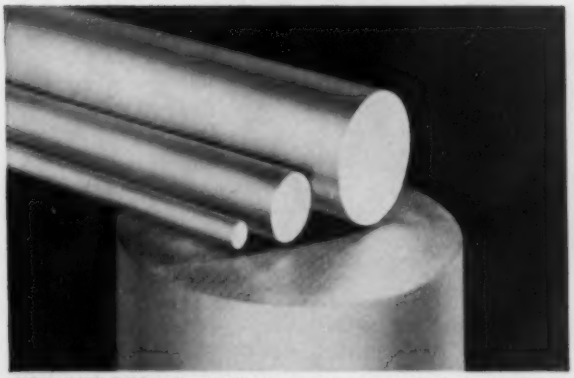
EXTRUDED SHAPES All standard alloys are available in custom shapes (solid, semi-hollow and hollow), structural, rod and bar, and in extruded tube and pipe.

SHEET AND PLATE Supplied as flat sheet, plate, coil sheet, circles in a complete range of alloys, sizes and tempers. Specialty sheet items available on inquiry.



WIRE Supplied as round or hexagonal drawn wire. Also rivet, welding, screening, EC and redraw wire.

Dependable Quality
is our first responsibility



ROD AND BAR Available in a wide range of alloys in rolled and cold finished rod and bar, round and hexagonal standard screw machine stock, hexagonal bar, redraw bar, rivet rod and round forging stock, square and rectangular bar.

PIG, INGOT AND BILLETS Kaiser Aluminum produces Pig, Ingot and Extrusion Billets in a range of alloys and sizes to meet your specific requirements.

WE BELIEVE that one reason why so many manufacturers choose Kaiser Aluminum is *dependable quality*.

We consider this our major responsibility—to see that every shipment we make arrives in the exact form, shape, size and chemical composition which will best serve the manufacturer's needs.

We take many steps to assure the high quality of Kaiser Aluminum.

We maintain one of the most modern and best-equipped research and development laboratories in the industry.

Physical tests are constantly conducted to check the quality of the aluminum, and also to determine if a different alloy or technique would do a better job at lower cost.

A system of rigid and continuous inspection assures that customer specifications are met exactly.

When desired, and at no cost to you, our field engineers will give you machine-side assistance in obtaining the highest quality possible from your equipment.

We believe we are ideally equipped to work with you because our efforts are put behind the job of serving manufacturers—to help improve their products and reduce costs.

For complete information, call or write any Kaiser Aluminum sales office or one of our many distributors, located in principal cities. See our catalog in Sweet's Product Design File or write for copy. Kaiser Aluminum & Chemical Sales, Inc., *General Sales Office*, Palmolive Bldg., Chicago 11, Illinois. *Executive Office*, Kaiser Bldg., Oakland 12, California.

Other Kaiser Aluminum products include: industrial foil, and electrical conductor. Kaiser Aluminum also supplies household, freezer and broiler foil for home uses; Shade Screening for the building industry, and roofing and siding sheet for farm and industrial buildings.

Kaiser Aluminum

setting the pace—in growth, quality and service

SEND FOR THE NEW PRODUCT DESIGN CATALOG,

containing 24 pages of valuable information on all Kaiser Aluminum Products.

KAISER ALUMINUM & CHEMICAL SALES, INC.
Industrial Service Division
5240 Kaiser Bldg., Oakland 12, California.

Please send my free copy of the Product Design Catalog.

Name_____

Firm_____

Address_____

City_____ State_____

DoALL *finds that Nickel Alloys combine needed properties such as:*

High wear resistance plus ready machinability

Nickel Cast Irons, Nickel Steels and Ductile Iron contribute to the ruggedness and wear-resistance of grinders . . . standard and special . . . produced by the DoALL Company, Des Plaines, Ill. Bases, tables, saddles, vertical slides, taper gibs, wear strips and sub-plate, on standard surface grinders are of 1½-2% nickel alloy iron. This iron is also used for similar important castings in the DoALL special rotor plunge grinder.

SPECIFY almost any logical combination of strength, toughness, hardness, corrosion resistance or other needed properties . . .

And you'll usually find a standard material that exactly answers both your fabricating and service demands from among the many grades of nickel alloys.

In fact, you'll probably discover . . . as DoALL did . . . that nickel alloys provide advantages which no unalloyed composition can match.

Properties combined in nickel-containing alloys contribute, for instance, to the efficiency of many components in the widely used DoALL grinders . . . both standard and special. Parts that must combine a high degree of wear resistance plus ready machinability, for example, are cast in alloy irons containing 1.50 to 2.00% nickel.

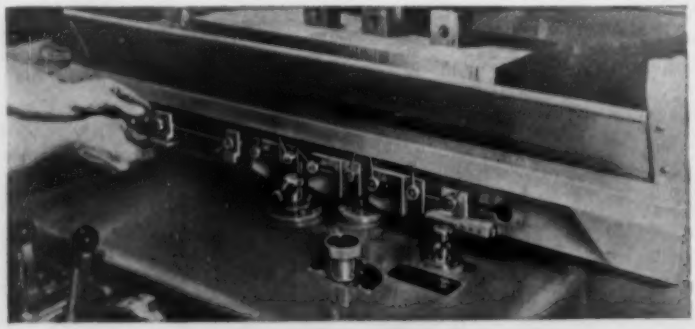
And components that call for resistance not only to wear, but also for some resistance to shock loads or sudden stresses, are cast in Ductile Iron fortified with about 1.50% nickel.

Spiral gears and arbors on standard DoALL types, and also pistons for special rotor grinders, are specified in a casehardened 8600 series nickel alloy steel. This grade of nickel-containing steel makes possible a wear-resistant surface supported by a core that resists fatigue and shock. A direct hardened steel of this same series is used for certain stressed gears in DoALL special grinders.

The advantages of weight saving, compactness, durability and strength . . . along with superior response to fabrication . . . may generally be obtained by using the correct nickel alloy. Whatever your industry, let us help you with your metal problems. Send us details for our suggestions. Write us today.

INCO
TRADE MARK

Ductile Iron trip dogs help DoALL grinders achieve peak precision and output. These components are easily spaced to speed up table motion desired between parts or jigs during slow "crush form" grinding of precision parts.



THE INTERNATIONAL NICKEL COMPANY, INC. 67 WALL STREET NEW YORK 5, N. Y.

THE BIG LIFT

350-TON *Alliance* LADLE CRANE HANDLING 510-TON TEST LOAD

Alliance Cranes handle the world's largest loads with ease. This 350-ton, 4-girder, 60-foot-span ladle crane, equipped with a 60/25 trolley, is one of two delivered recently to a Midwest steel company for open hearth duty. The photo shows it handling a 510-ton test load.

The 24 track wheels on the bridge are spaced to obtain equal loading on each wheel. The trolley rolls smoothly on 16 track wheels arranged to provide transverse and longitudinal equalization.

The operator's cab is air conditioned.

Alliance Cranes are as safe as they are big. They have to be. The crane pictured here is equipped with laminated ladle hooks, safety rope reeving, interlocked drums and synchronized worm drive. The hoist gearing is so proportioned that the full capacity of the crane can be lifted by one motor without exceeding the quarter-hour rating. These time-tested safety devices were developed and engineered by Alliance.

When you face your next big lifting problem, discuss it with Alliance. Alliance will help you reach an efficient, economic solution.

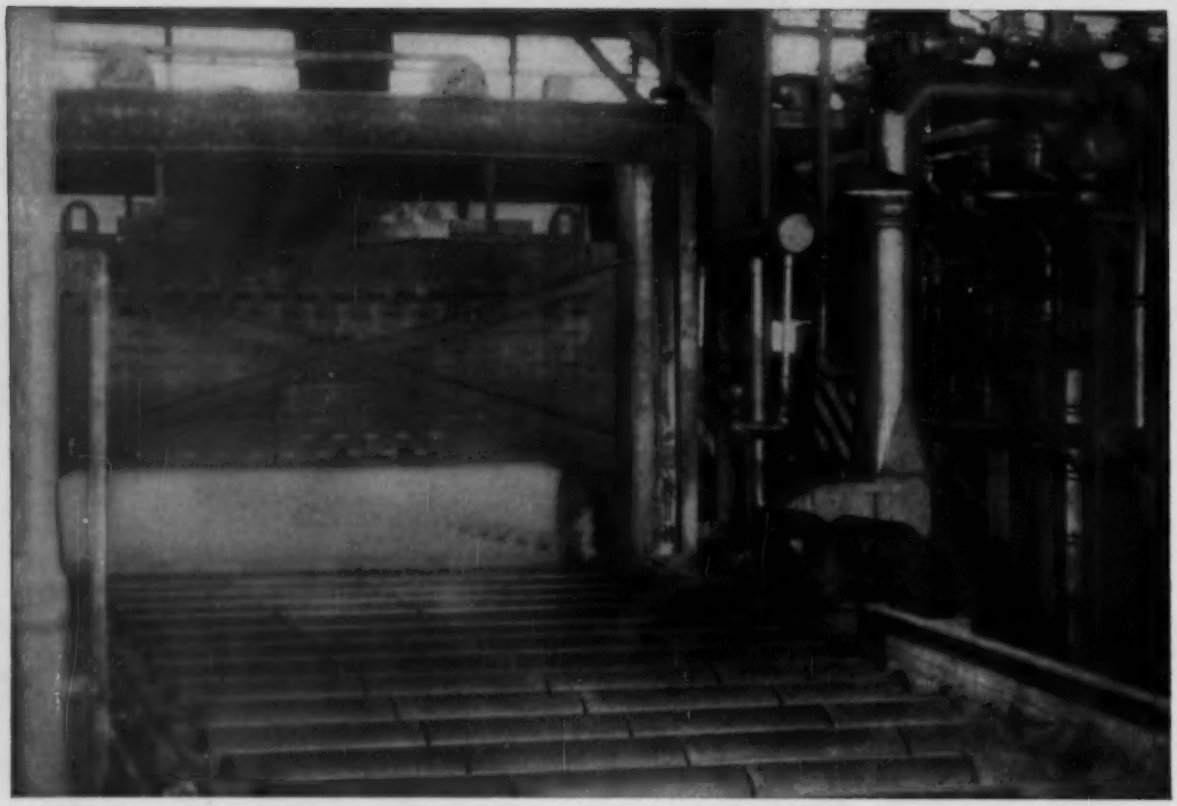
World's Largest Builders of the World's Largest Cranes

THE *Alliance* MACHINE COMPANY

Main Office: Alliance, Ohio *Founded 1901*

LADLE CRANES • GANTRY CRANES • FORGING MANIPULATORS • SOAKING PIT CRANES • STRIPPER CRANES • SLAB AND BILLET CHARGING MACHINES • OPEN HEARTH CHARGING MACHINES • SPECIAL MILL MACHINERY • STRUCTURAL FABRICATION • COKE PUSHERS

Give Us The Runway And We'll Lift The World



3800 hours at 2150 deg. F.

The HASTELLOY alloy X rollers in this gas-fired heating furnace have been in use for 3800 hours. They operate in a neutral atmosphere at 2150 deg. F. They are also subjected to mechanical and thermal shock as they come in contact with the cold sheet metal being heated. A recent inspection showed that the HASTELLOY alloy X parts are still in excellent operating condition.

The rollers were fabricated from HASTELLOY alloy X sheet, 3/16 in. thick. The sheets were formed into shells 7½ in. in diameter and six feet long. The shells were then slipped over 2-in. water-cooled pipe, and refractory material was packed into the space between the shells and shafts. Spiders on the shafts were used to keep the shells concentric.

HASTELLOY alloy X has excellent forming characteristics, and good creep and stress-rupture properties. At 1200 deg. F. this nickel-base alloy has an ultimate strength of 82,000 lb. per sq. in., and even at 1500 deg. F. the ultimate tensile strength is 48,000 lb. per sq. inch. Its outstanding resistance to oxidizing, reducing, or neutral atmospheres makes it especially useful in furnace applications.

For information on prices, sizes, and properties of HASTELLOY alloy X write to any of the district sales offices listed below.

"Hastelloy" and "Haynes" are registered trade-marks of Union Carbide and Carbon Corporation.

HAYNES TRADE-MARK ALLOYS

HAYNES STELLITE COMPANY

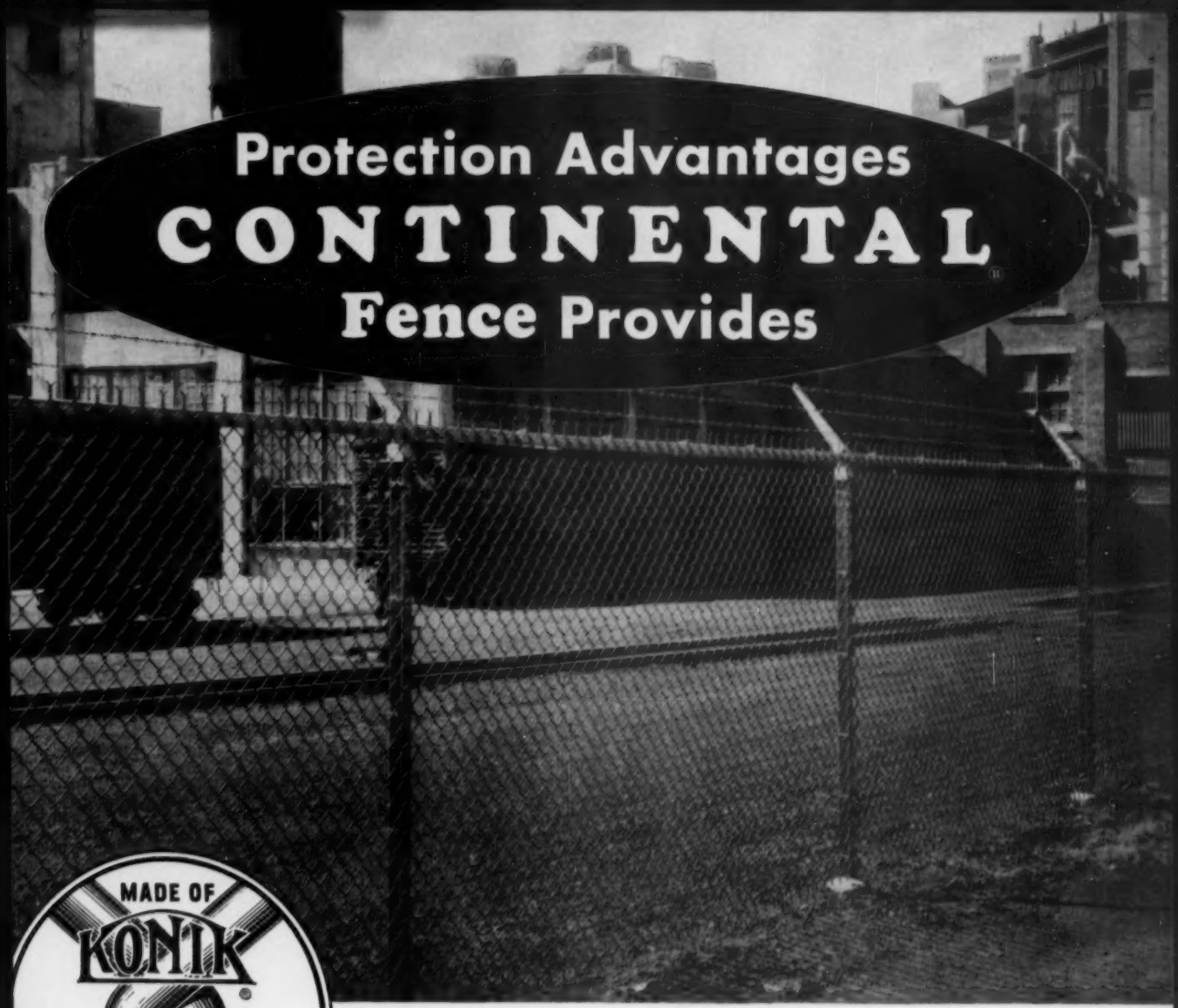
A Division of Union Carbide and Carbon Corporation

UCC

General Offices and Works, Kokomo, Indiana

Sales Offices

Chicago • Cleveland • Detroit • Houston • Los Angeles • New York • San Francisco • Tulsa



Protection Advantages CONTINENTAL Fence Provides

MADE OF KONIK® STEEL

Konik steel contains copper, nickel and chromium for greater strength and rust resistance.

- **Reduced Expense in Guarding Property**
- **Controlled Entrance and Exit to Property**
- **Security in Labor Difficulties**
- **Fewer Accidents—Reduced Liability**
- **Increased Outdoor Storage Space**
- **Reduced Fire Risk, Lower Insurance Rates**
- **Better Appearance, Higher Property Value**
- **Lasting Protection against Theft, Vandalism**

CONTINENTAL STEEL®

CONTINENTAL

STEEL CORPORATION · KOKOMO, INDIANA

Producers of

Manufacturers Wire in many sizes, shapes, tempers and finishes, including Galvanized, KOKOTE, Flame-Sealed, Coppered, Tinned, Annealed, Lacquer Finished, Bright, and Special Wire. Also, Coated and uncoated Steel Sheets, Nails, Continental Chain Link Fence, and other products.

Continental Steel Corp.
Kokomo, Indiana

Please send free copy of your "Planned Protection" manual without obligation.

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Address_____

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...a new concept of the.....

Since 1914 Bullard Mult-Au-Matics have been widely used in many industries requiring high production of parts with repetitive accuracy.

The Mult-Au-Matic Type "L" incorporates many new developments.

. . . Here are some of them . . .

★ **CONTROL SYSTEM**
All functions of the machine are controlled from conveniently located push buttons with minimum operator effort and maximum safety.

★ **FEED MECHANISM**
Completely new screw type feed works provide a 16" stroke with 81 feed changes ranging from .0025 to .0625.

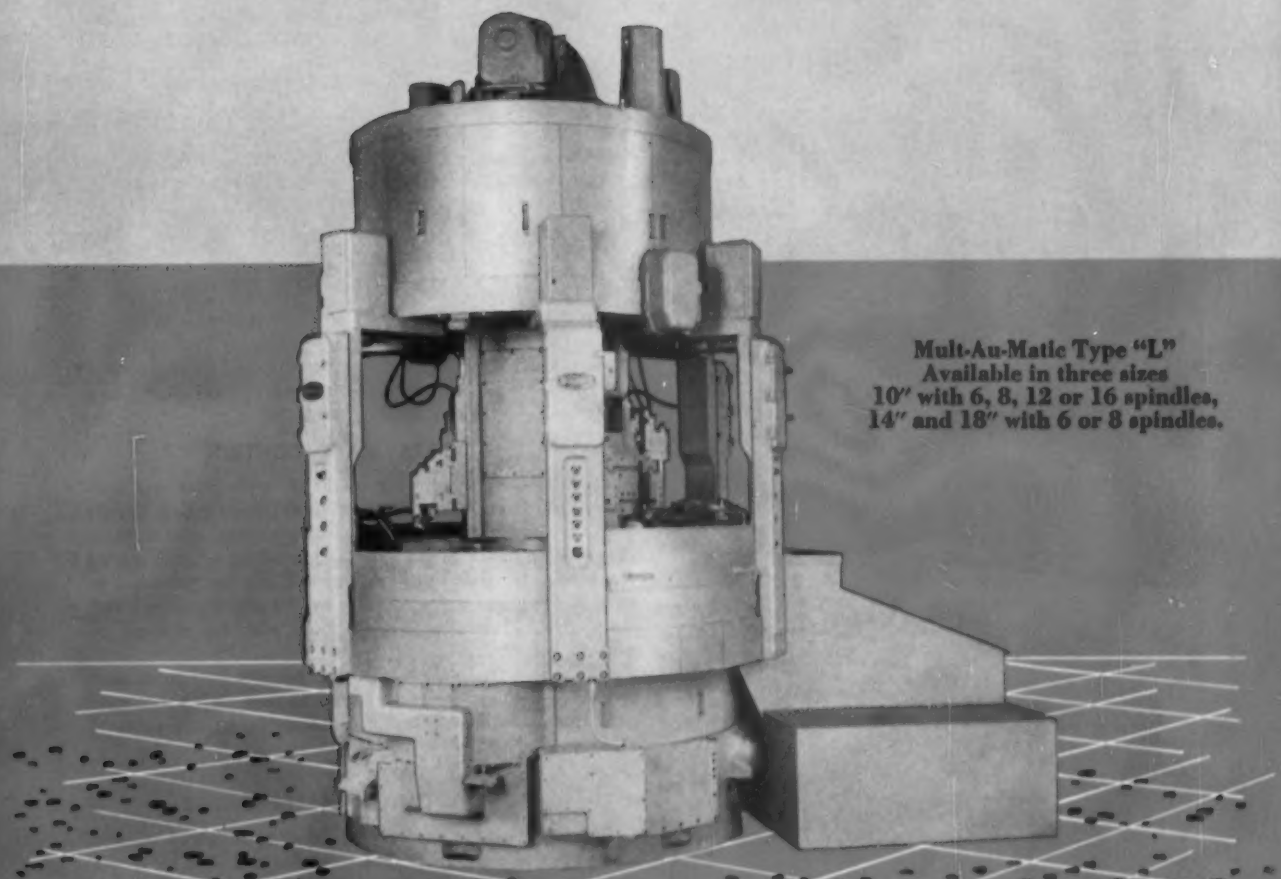
★ **SELECTIVE SPINDLE SPEEDS**
At each station, speed range from 35 rpm to 1,000 rpm allows selection of correct cutting speed to suit operation at each station.

★ **CARRIER INDEX**
New mechanism permits faster indexing of carrier which saves time between cuts.

★ **OPTIONAL EQUIPMENT**
Includes multi-purpose heads, drill heads, tapping heads, precision boring heads, automatic loading and gauging equipment and chip removal conveyors.

SEVENTY FIFTH
1891 BULLARD 1966
ANNIVERSARY

BULLARD MULT-AU-MATIC



Mult-Au-Matic Type "L"
Available in three sizes
10" with 6, 8, 12 or 16 spindles,
14" and 18" with 6 or 8 spindles.

For the complete story use this coupon
for your copy of the new catalog.

THE BULLARD COMPANY

286 Canfield Avenue • Bridgeport 2, Connecticut

Please send me a copy of the
NEW MULT-AU-MATIC TYPE "L" CATALOG

NAME_____

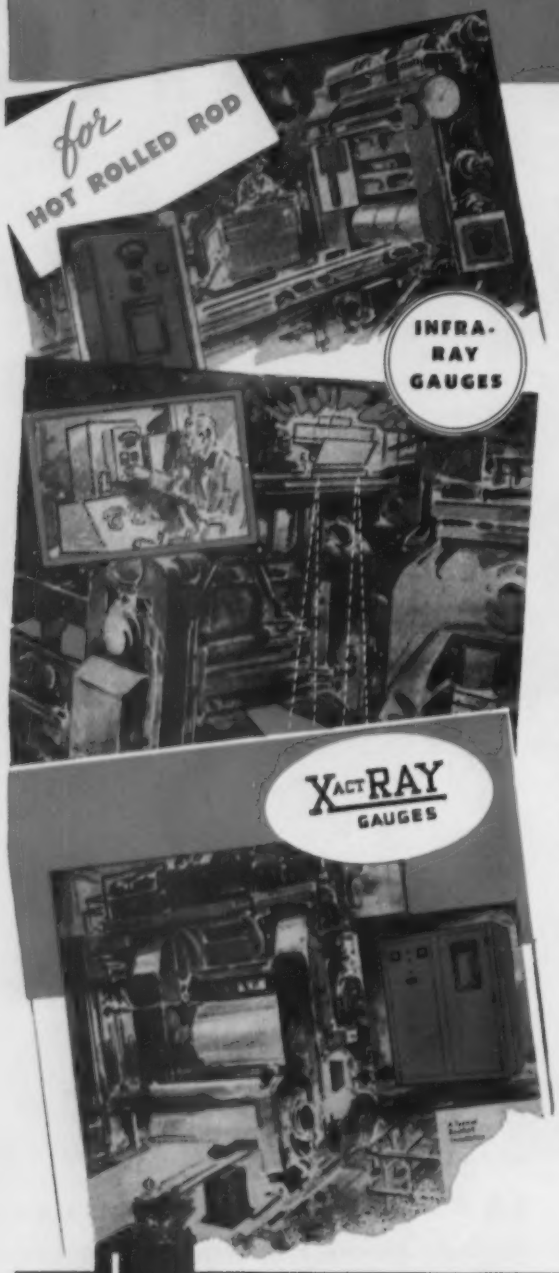
COMPANY_____ POSITION_____

ADDRESS_____

CITY_____ ZONE____ STATE_____

Cut Mill Costs

WITH MODERN NON-CONTACT GAUGES



HOT STRIP WIDTH

THE INFRA-RAY WIDTH GAUGE

A continuously indicating non-contact gauge operated by radiation from the material being measured—hot strip, plate, skelp, band, bar, shapes, or tubing.

On hot strip finishing stands it is not simply a width indicator. It provides a responsive method of making width by use of *controlled tension.*

This INFRA-RAY Width Gauge reduces trim scrap, avoids hold-back orders to replace a too-narrow coil, and holds mill edge material to closer tolerance.

HOT OR COLD STRIP THICKNESS

THE XactRAY THICKNESS GAUGE

An X-ray operated gauge for non-contact, accurate, continuous indication of strip thickness. A trouble-free, non-mechanical, simply-operated thickness gauge that can be adapted to any size or type of rolling mill and mounted close to the rolls.

THE XactRAYMATIC CONTROL

Electronic equipment for automatic strip thickness control—operated by the signal of the X-ray Gauge. Limits thickness deviation of strip from single stand mills or from the first stand of tandem mills by control of roll screw-down motors. Additional equipment can be provided to control thickness automatically by the same means used manually in the remaining stands, with no change of present mill controls.

This XactRAY Thickness Gauge permits you to accept orders with tolerances impossible to meet by hand control, increase speed of rolling, reduce scrap and returns.

HOT ROLLED ROD DIAMETER

THE INFRA-RAY DIAMETER GAUGE

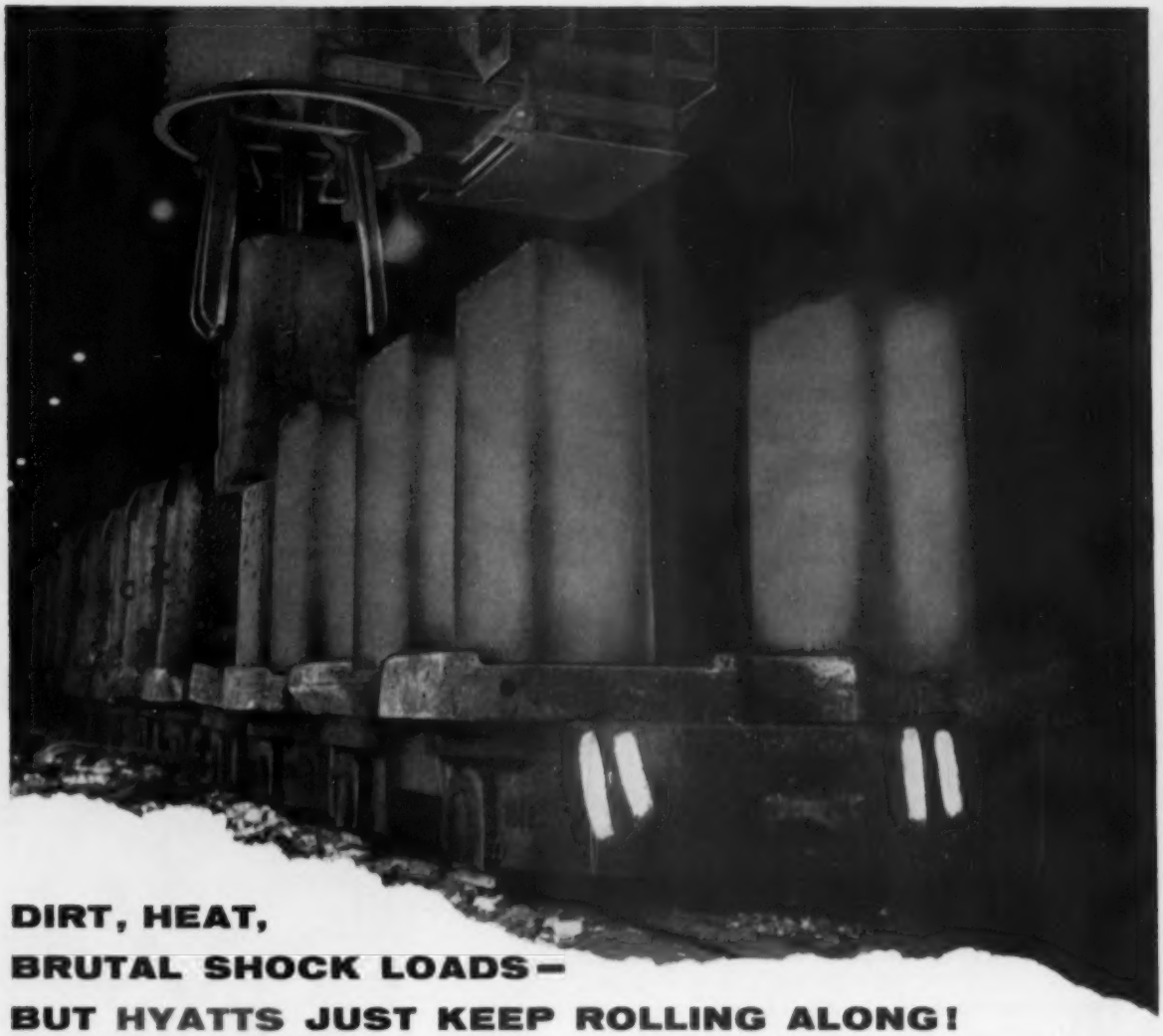
For continuous measurement of the diameter of hot rolled wire rod as it emerges from the mill. The infra-red radiation of the rod itself supplies the operating signal to the gauge head which is mounted several feet from the rod.

This INFRA-RED Diameter Gauge will not only measure diameter continuously but will also detect lean rod, overfill, squashouts, and crossed rolls.

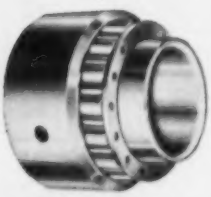
IGC **INDUSTRIAL GAUGES CORPORATION**

ENGLEWOOD, NEW JERSEY

Write for Details



DIRT, HEAT, BRUTAL SHOCK LOADS— BUT HYATTS JUST KEEP ROLLING ALONG!



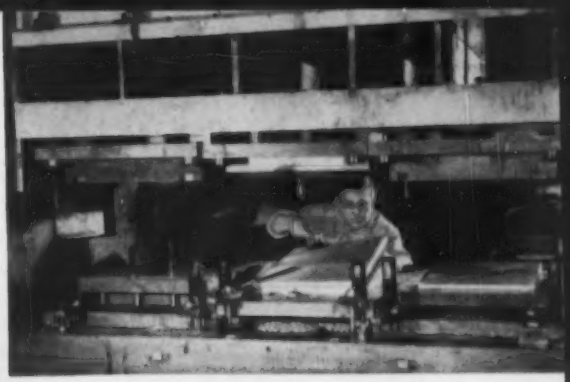
Keep your production rolling profitably with

You're looking at a mighty tough spot for a roller bearing—the 7-inch axles of an ingot car that carries an 80,000-lb. load. That's why we think it's significant that the steel industry has *far more HYATTS on ingot and charging cars than any other make.*

Take these at Jones and Laughlin Steel Corporation's Cleveland Works, for instance. J & L has found that: HYATTS greatly reduce friction and starting power needs—permit longer trains, faster and smoother car spotting. HYATTS operate dependably despite abrasive dirt, constant heating and cooling, and pile-driver shock loads when the stripper has to pound 10-ton ingots free from the molds. Their straight cylindrical design permits lateral expansion without cramping rollers, and ample reserve for overloads. HYATTS *virtually eliminate costly downtime.* Month after month, they absorb this brutal beating and keep coming back for more! Hyatt Bearings Division, General Motors Corporation, Harrison, New Jersey.

HYATT ROLLER BEARINGS

STRAIGHT BARREL TAPER



Hydraulic press where door panels are formed. Left-hand die punches and forms; center die second-forms and trims excess metal, right-hand die final forms.

Punching and counter-sinking holes for handle and fastenings.

Strikingly beautiful **color-chrome gas range** by Magic Chef, Inc., St. Louis, Mo.

How Stainless Steel helps Magic Chef bring glamour into the kitchen

MAGIC CHEF'S new *color-chrome gas range* is an eye-catcher anywhere you see it—in the kitchen or on the sales floor. Highlighting the beautiful decorator colors of the porcelain enamel top and sides is a front of gleaming Stainless Steel.

There's real beauty here, but that's not the whole story. There's the durability of long-lasting Stainless Steel. And there's the ease with which Stainless Steel's smooth, dense surface can be cleaned—year after year.

This is the kind of sales appeal that Stainless lends to an almost countless list of products. And you can have it with surprising ease of fabrication (See "Fabricating Facts"). Put this appeal in your products, and when you do, follow the lead of successful fabricators who use service-tested USS Stainless Steel in the products they make.

FABRICATING FACTS

Compartment door, oven door and broiler drawer panels are fabricated from USS 18-8 Stainless Steel sheets, No. 3 finish.

Sheets are dry-coated with drawing compound, then sheared to blank size. Forming takes place in an hydraulic press, using three dies. Stainless Steel sheets form easily and without distortion in a die setup designed for carbon steel sheets.

Panels are paper-wrapped to protect against scratching; holes for fasteners are punched and counter-sunk. Dry-coating is removed; panels are sub-assembled and sent to the production line for final assembly.

See The United States Steel Hour. It's a full-hour TV program presented every other week by United States Steel. Consult your local newspaper for time and station.

UNITED STATES STEEL CORPORATION, PITTSBURGH • AMERICAN STEEL & WIRE DIVISION, CLEVELAND
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO • NATIONAL TUBE DIVISION, PITTSBURGH
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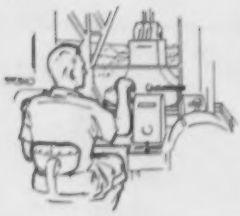
USS

USS STAINLESS STEEL

SHEETS • STRIP • PLATES • BARS • BILLETS • PIPE • TUBES • WIRE • SPECIAL SECTIONS

5-09

UNITED STATES STEEL



Look at the record!

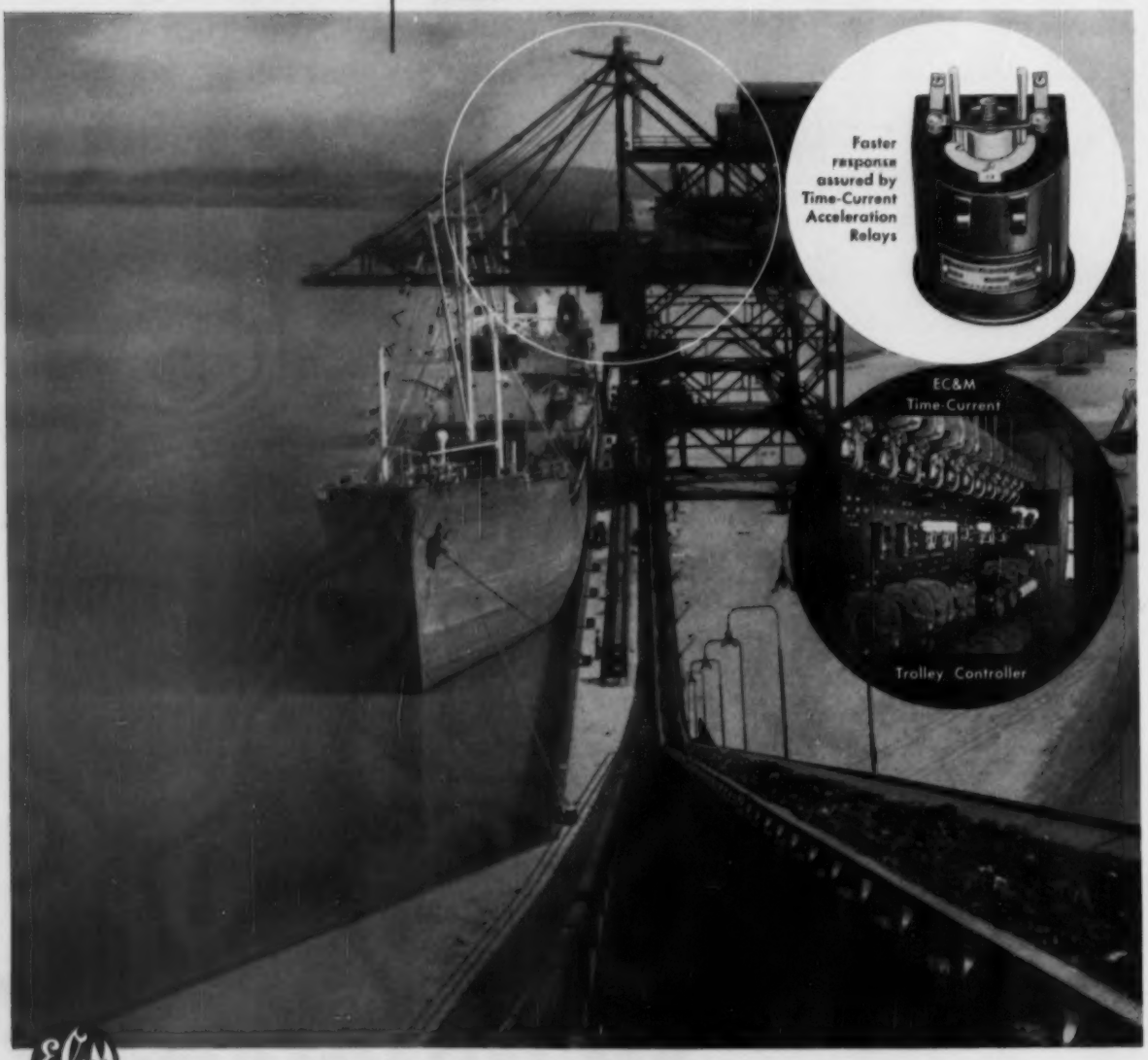
15-Ton unloaders with EC&M control set new records in unloading time and low maintenance costs at the Baltimore & Ohio, Curtis Bay Ore Pier

20,560 TONS OF IRON ORE UNLOADED IN 13 HOURS AND 55 MINUTES! Fast-operating EC&M Line-Arc Contactor Control with EC&M Time-Current Acceleration helped establish this record.

EC&M Control Apparatus and Control Engineering also provide outstanding safety during all operations. Power for motor drives is fed through operator's cab for safe, direct control. Dynamic braking for quick trolley stop is automatically applied in end-zones and if power fails. EC&M Quadruplex Controllers insure that the 4 bridge motors share the load equally and that brakes release and set uniformly.

Replacement part cost, in this installation, has been only 25¢ per 1000-tons of ore unloaded over a 3 year period. The record proves that high output with low upkeep is yours when you select EC&M Control.

Write today for Bulletin 921-OU



THE ELECTRIC CONTROLLER & MFG. CO. 2698 E. 79th Street • Cleveland 4, Ohio

Need a long-life chain for furnace service?

Aluminum billets move through normalizing furnace at 900°F on Link-Belt Class SM-584 chain with 'K' attachments. Cast center links are connected to bar steel sidebars by steel pins locked in place.

Specify LINK-BELT SM or SMGL ...chains that are right for the job

THESE combination chains are designed and built for the demanding service of moving materials through normalizing and heat treating furnaces. Their sturdy, well-proportioned members maintain fit despite hard usage at high temperatures.

The extra life built into these chains is typical of every chain in the complete Link-Belt line. Accurate control of raw materials and manufacturing processes is your assurance of uniformity and long life.

For complete information on chains and sprockets for conveying or drive service, get in touch with your nearest Link-Belt office or distributor. They can show you the *one* chain that's best suited to your needs.

LINK-BELT

CHAINS AND SPROCKETS

LINK-BELT COMPANY: Executive Offices, 307 N. Michigan Ave., Chicago 1. To Serve Industry There Are Link-Belt Plants, Sales Offices, Stock Carrying Factory Branch Stores and Distributors in All Principal Cities. Export Office, New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville, N.S.W.; South Africa, Springs. Representatives Throughout the World. 19.523

"Sure I Got the Order...

because I know we can get the Bristol Brass to make it!"

FAMILIARITY breeds many things. In this case, it bred confidence. And confidence is what our high-spirited friend just drew on, to nail down his order. For he's completely confident, out of past experience, that he can bank his (and his firm's) good name on Bristol to deliver the Brass precisely as specified, exactly when needed. No worries, for him, about an almost-completed order sitting in his plant waiting for overdue Brass strip, rod, or wire, while his customer calls up his competitors.

Most likely his next call will be Bristol, Connecticut — Ludlow 3-9246 — where the first man who talks to him (no matter who) will take the ball and carry it all the way. And that means no conferences, call-backs, stall-offs or double-checking with other people.

And now . . . BRASS FORGINGS, too . . .
The Bristol Brass Corporation announces the acquisition of Accurate Brass Company, 73rd Ave. & 88th St., Brooklyn 27, N.Y.
"How do you know it can't be forged?"

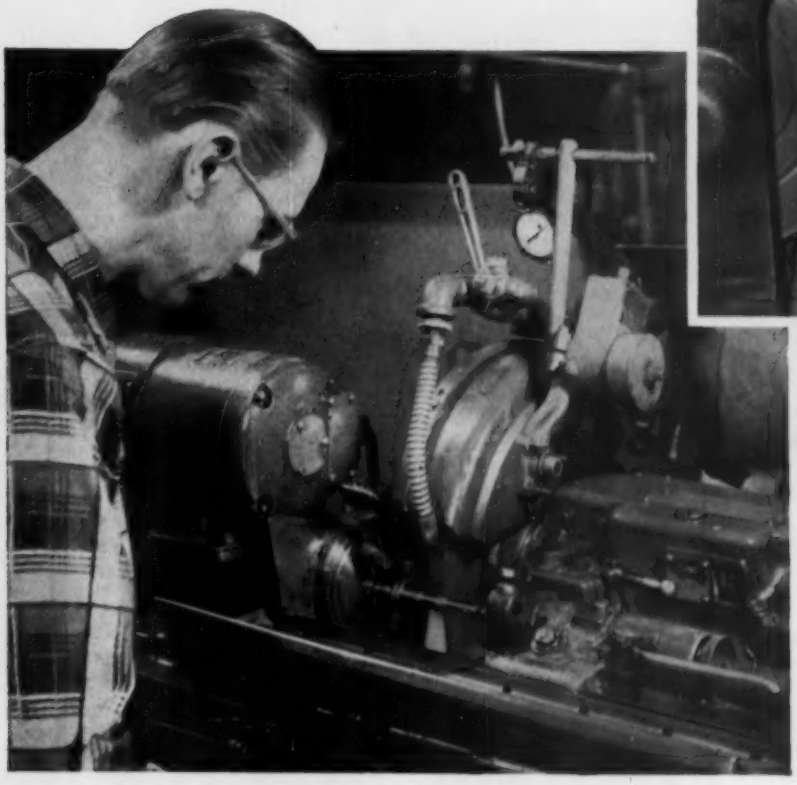
And you can bank on Bristol just as confidently. When you need any Brass alloy fast and right . . . a lot or a little . . . just call that same number, Ludlow 3-9246, and say: "I want to place an order". From that moment on, you have a new business experience in store for you!

The BRISTOL BRASS CORPORATION has been making Brass strip, rod and wire here in Bristol, Connecticut since 1850, and has offices and warehouses in Albany, Boston, Buffalo, Chicago, Cleveland, Detroit, Milwaukee, New York, Philadelphia, Providence, Rochester, Syracuse. The Bristol Brass Corporation of California, 1217 East 6th St., Los Angeles 21. The Bristol Brass Corporation of Ohio, 1607 Broadway, Dayton.

"Bristol-Fashion" means Brass at its Best

Norton G Bond wheels set new economy records in O.D. grinding

Users tell how "TOUCH of GOLD" performance boosts production rate, product quality and profits



"Production rate increased almost 50% with G Bond wheels, and both wheel life and diamond life have doubled," are typical "Touch of Gold" advantages reported by this cylindrical grinding customer. Job is grinding chrome plated gages ¼" to 2" O. D. The material removed is .002" to .003", and the finish is 4 to 8 microinches. Previous wheels required dressing every hour — G Bond wheels are dressed every 8 hours.

"We cut grinding time by two-thirds with G Bond wheels. Also, the G Bond wheels cut cooler, produce a much better finish, and give us 23 parts per dressing compared to the 10 we used to get." That's the report on this centerless grinding job. The work is aircraft slip joint sleeves of 321 stainless steel, chrome plated, 3½" diameter x 7" long and .060" wall. Stock removal is .010" to .015", at .005" per pass.

Users all over the country report that Norton G Bond wheels have given them an entirely new slant on the profit-possibilities of their centerless and cylindrical grinding jobs.

The two examples pictured here are typical of the very many enthusiastic endorsements that are pouring in. And you could sum them all up in this sentence: "G Bond wheels grind faster, finish better, last longer and save us money on every job."

The Norton G Bond is by far the most efficient vitrified bond ever developed for precision and semi-precision grinding. Wheels made with it outperform all others, with "Touch of Gold" advantages like these:

Cooler cutting action . . . faster stock removal . . . better finish . . . more pieces per dressing . . . longer wheel life . . . easier dressing, with less wear on diamond or on crushing roll.

See your Norton distributor

for proof of how G Bond wheels can help improve your products and cut your production costs. Or write to NORTON COMPANY, Worcester 6, Mass. Distributors in all principal cities, listed under "Grinding Wheels" in your phone directory yellow pages. *Export:* Norton Behr-Manning Overseas Incorporated, Worcester 6, Mass.

Making better products . . . to make your products better

W-1608

NORTON

and its BEHR-MANNING division

NORTON: Abrasives • Grinding Wheels • Grinding Machines • Refractories
BEHR-MANNING: Coated Abrasives • Sharpening Stones • Pressure Sensitive Tapes

A Completely New and Different PAYLOADER®

...years ahead in design, construction and performance!

the NEW model HA

Thirty four years of pioneering experience by the manufacturer who has produced more complete tractor-shovel units than all others put together . . . more than three years of development and field-testing . . . this new HA model may well set new standards of mobile bulk materials handling performance for industrial operations.

...actual performance records prove amazing superiority!

carrying capacity?

TWICE AS MUCH as previous HA model; more than any other comparable size.

lifting capacity?

MORE THAN TWICE AS MUCH as previous; more than any other comparable size.

digging capacity?

MORE THAN TWICE AS MUCH as previous; more than any other comparable size.

bucket capacity?

16-2/3% INCREASE in (struck) capacity; 18 cubic feet PAYLOAD (heaped) capacity.

dumping height?

18 PERCENT INCREASE in maximum dumping height over previous "HA" PAYLOADER model.

turning radius?

SHORTER TURNING RADIUS than before with no increase in width, height or wheelbase.

safety features?

SETS NEW STANDARDS of safety in load carrying and driver protection.

production output?

INCREASED 50 TO 100% over previous model; more than any other comparable size.

accessibility?

IMPROVED EASE OF ACCESSIBILITY of all service points for better maintenance.

other features?

BREAKOUT BUCKET ACTION with 40° TIPBACK; sealed brakes; improved steering; new solenoid starting controls; new ignition lock; hydraulic accumulator; sealed and pressurized hydraulic tank; double-acting rams; torque converter; improved bucket construction; dustproof distributor; hose connectors; sealed grease fittings; new pin lock design; improved ground clearance; increased drawbar pull; chrome-plated piston rods; new parking brake and many others. Send for new specification catalog.

PAYLOADER®

THE FRANK G. HOUGH CO. LIBERTYVILLE, ILL.

SUBSIDIARY—INTERNATIONAL HARVESTER COMPANY

THE FRANK G. HOUGH CO.
[illegible] LIBERTYVILLE, ILL.

Send me full information on the new Model HA

Name .....

Title .....

Company .....

Street .....

City ..... State .....

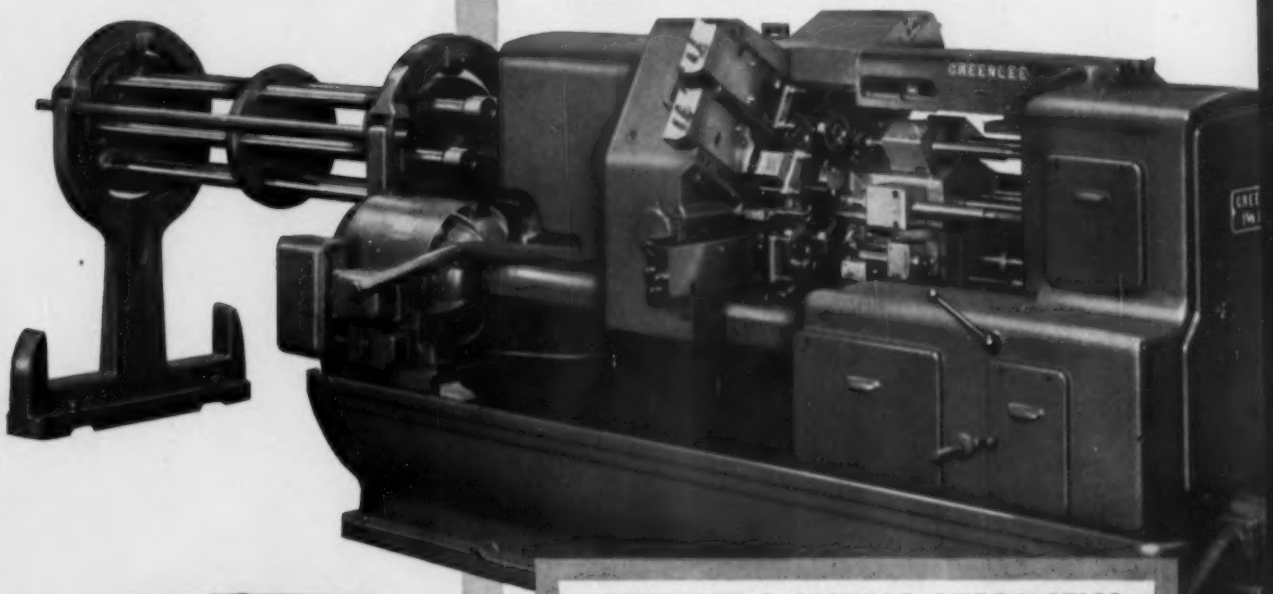
PRODUCTION MACHINERY

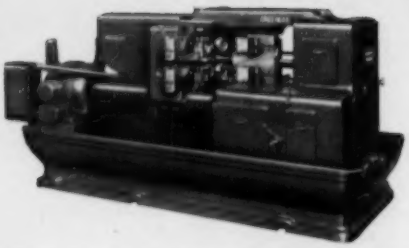
GREENLEE

AUTOMATIC BAR MACHINES

INCREASE YOUR PRODUCTION... LOWER YOUR COSTS!

CUT YOUR SET-UP TIME
SPEED-UP DIFFICULT OPERATIONS





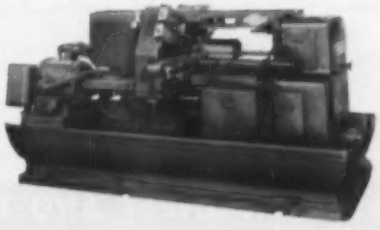
GREENLEE 6-SPINDLE AUTOMATICS
SPECIFICATIONS

Rating	1"	1-5/8"	2"
Chuck Capacity, Round	1"	1-5/8"	2"
Chuck Capacity, Hexagon	7/8"	1-13/32"	1-3/4"
Chuck Capacity, Square	3/4"	1-1/8"	1-7/16"
Stock Feed	6-3/16"	8-5/16"	8-5/16"
Turning Length	6"	7-1/2"	7-1/2"
Spindle Speed Range	225 to 2500	105 to 2175	95 to 1935
Feed Range per Spindle Rev.	.0014 to .0218	.0017 to .0388	.0019 to .043
Motor Horsepower	15	20	25
R. P. M.	1800	1800	1800
Floor space:			
Length with Stock Reel	17'-6"	17'-3"	17'-3"
Width	5'-0"	5'-4"	5'-4"
Height	4'-11"	5'-4"	5'-4"
Net Weight in Pounds	14,400	17,940	18,150

GREENLEE 4-SPINDLE AUTOMATIC
SPECIFICATIONS

Rating	2-5/8"
Chuck Capacity, Round	2-5/8"
Chuck Capacity, Hexagon	2-1/4"
Chuck Capacity, Square	1-7/8"
Stock Feed	8-3/16"
Turning Length	7-1/2"
Spindle Speed Range	120 to 1200
Feed Range per Spindle Rev.	.002 to .0458
Motor Horse Power	20
R. P. M. of Motor	1800
Floor Space:	
Length with Stock Reel	17'-3"
Width	5'-4"
Height	5'-0"
Net Weight in Pounds	17,000

GREENLEE 2ND OPERATION AUTOMATIC



Extremely versatile, high-production machines. Parts can be loaded semi-automatically or fully automatically. Incorporates the same basic features . . . inherent production and operating advantages as the standard 6-Spindle Automatics.

INVESTIGATE NOW
PHONE
ROCKFORD, ILLINOIS
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PRODUCTION MACHINERY

GREENLEE

GREENLEE BROS. & CO.
1802 MASON AVENUE
ROCKFORD, ILLINOIS

Which package is best for you?

ROEBLING HIGH CARBON WIRE is packaged in many ways... and for every kind of usage there's one particular type of packaging that will bring top handling and production efficiency... new economy in your plant. For certain wires, Roebling's new large-size reels or new disposable spoolless cores have special money-saving advantages:

The large reels are ideal for long runs. They reduce down time to a minimum.

The new spoolless core (a hollow fibre core without flanges) abolishes the storing and return of empty spools ... eliminates charges for spools and waiting for credits.

You *pay* for the best when you buy high carbon wire. Make sure you *get* it in wire and packaging. Specify Roebling. John A. Roebling's Sons Corporation, Trenton 2, New Jersey.

ROEBLING CF&I

Subsidiary of The Colorado Fuel and Iron Corporation

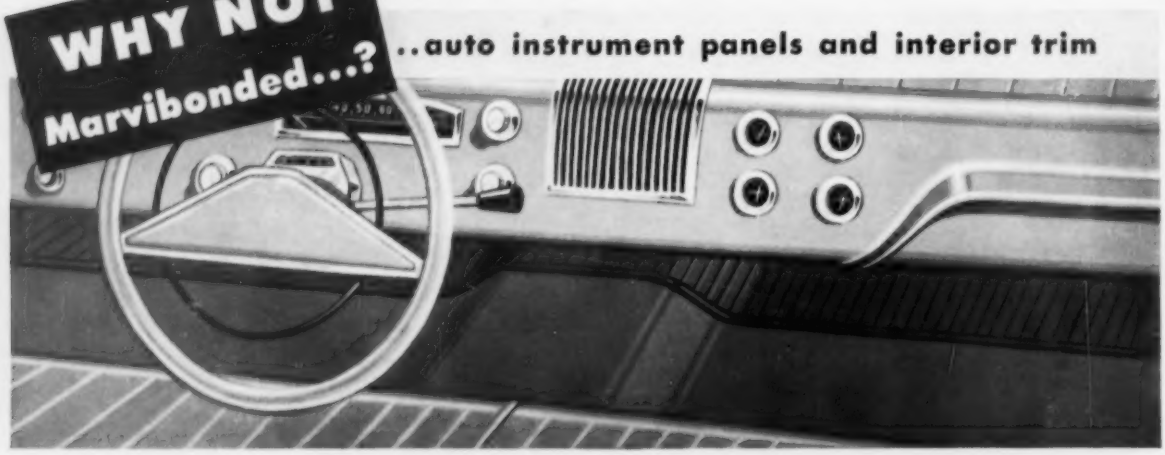
ATLANTA, 934 AVON AVE • BOSTON, 51 SLEEPER ST & 5 PITTSBURGH ST • CHICAGO, 5525 W. ROOSEVELT RD • CINCINNATI, 2253 FREDONIA AVE • CLEVELAND, 13225 LAKEWOOD HEIGHTS BLVD. • DENVER, 4801 JACKSON ST • DETROIT, 915 FISHER BLDG • HOUSTON, 6216 NAVIGATION BLVD • LOS ANGELES, 5340 E. HARBOR ST • NEW YORK, 19 RECTOR ST • ODESSA, TEXAS, 1920 E. 2ND ST • PHILADELPHIA, 230 VINE ST • ROCHESTER, 1 FLINT ST • SAN FRANCISCO, 1740 17TH ST • SEATTLE, 900 1ST AVE S. • ST. LOUIS, 3001 DELMAR BLVD • TULSA, 221 N. CHEYENNE ST • EXPORT SALES OFFICE, TRENTON 2, N. J.

Here's Marvibond*

a new vinyl-to-metal laminating process that gives sheet metal products all these advantages...

- lasting protection against rust and corrosion
- practically any surface effect desired
- superior abrasion resistance
- outstanding resistance to perspiration and most chemicals
- uniform coverage of almost any thickness
- good sound-deadening properties
- less costly fabrication

WHY NOT Marvibonded...? ..auto instrument panels and interior trim



vending machine housings

waste baskets

business machine housings

air conditioner cabinets

Window moldings and dashboards of Marvibonded laminates could be permanently clad with vinyl material to match door upholstery and seat trim. And practically any choice of texture is possible–from glare-free matte finishes to rich leather-like grains.

There'd be no checking or flaking, no worries about scratched paint—no need for waxing or other care. The tough, chemical-resistant vinyl cleans with a wipe.

What's more, the vinyl surface would always be warm and pleasant to the touch. Marvibonding ends problems of rust from moisture condensation. And it helps to deaden sound, as well as insulate against squeaks from metal to metal contact.

Why not Marvibonded panels and trim! Plenty of excellent reasons *why*. Excellent reasons why for hundreds of similar applications—like radio and television housings, business machine covers, vending machines, air conditioners, waste baskets, and many many more.

Better see what Marvibond can mean to your product! Write the address below today.

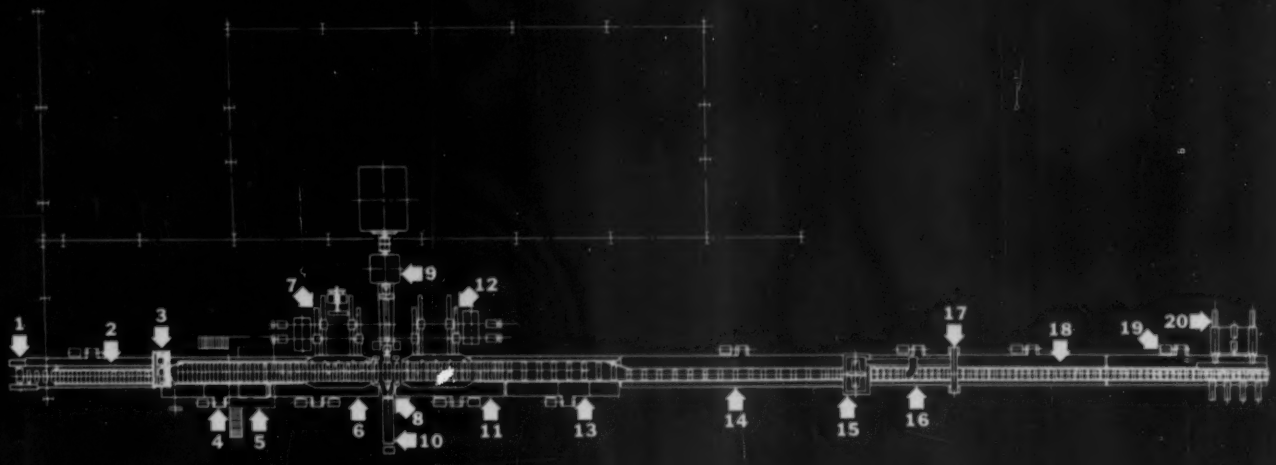
*Pat. applied for

Naugatuck Chemical

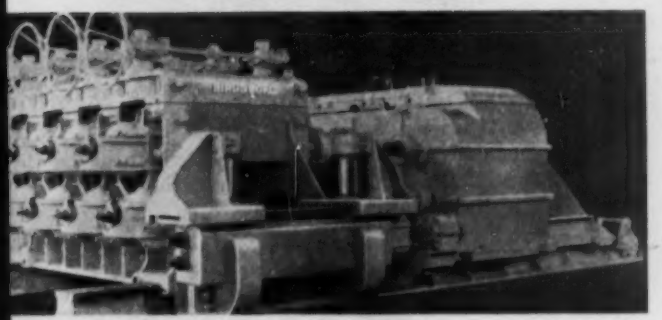
Division of United States Rubber Company
Naugatuck, Connecticut

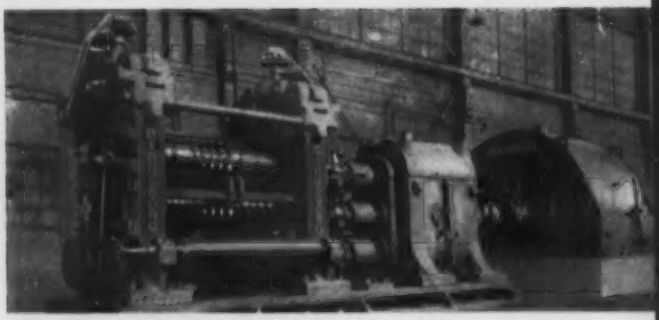
US RUBBER

BRANCHES: Akron • Boston • Charlotte • Chicago • Los Angeles • Memphis • New York • Philadelphia • IN CANADA: Naugatuck Chemicals, Elmira, Ontario
Rubber Chemicals • Synthetic Rubber • Plastics • Agricultural Chemicals • Reclaimed Rubber • Latices • Cable Address: Rubexport, N.Y.

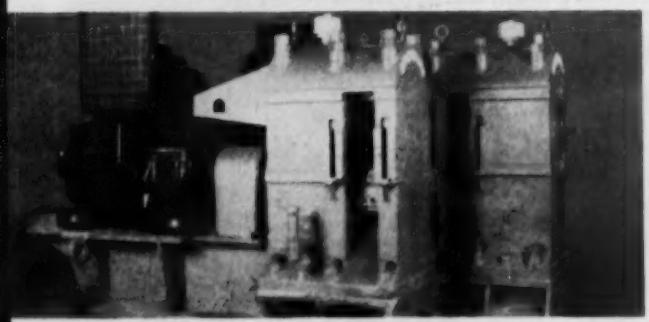


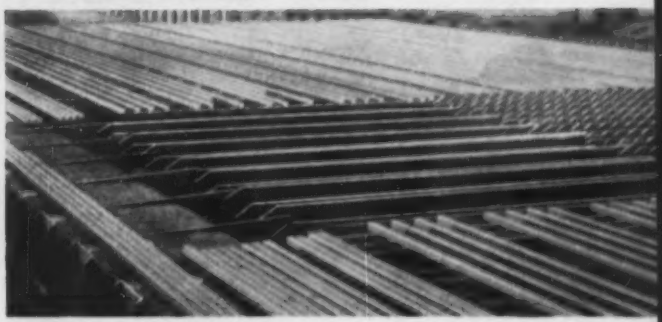
FROM COMPLETE MILLS . . . such as this 32" blooming mill layout





TO STRAIGHTENERS . . . . . TO ROUGHING MILLS





TO FLYING SHEARS . . . . . TO COOLING BEDS, for semi-finished products, and other auxiliary mill equipment

Designers and Builders of:

STEEL MILL MACHINERY
HYDRAULIC PRESSES
CRUSHING MACHINERY
SPECIAL MACHINERY
STEEL CASTINGS
Weldments "CAST-WELD" Design
ROLLS: Steel, Alloy Iron, Alloy Steel

you get

MAXIMUM EFFICIENCY AND ECONOMY

from . . .

BIRDSBORO

BIRDSBORO STEEL FOUNDRY & MACHINE CO., BIRDSBORO, PENNA. Offices in Birdsboro, Pa. and Pittsburgh, Pa.

AVAILABLE IMMEDIATELY—more than 500 years of unmatched Field Engineering Experience with the Torrington Needle Bearing *—will travel.*

Torrington Sales Engineers do more than sell bearings. It's their job to help manufacturers gain the unique advantages of the Needle Bearing for their products. They've racked up over 500 years of application know-how in the time the Needle Bearing has been on the industrial scene. All of it is available to you.

A Torrington Sales Engineer applies considerably more than his own wide experience to your anti-friction problem. He also draws on the resources and personnel of our Engineering Department and its complete files of Needle Bearing case histories.

Each problem is different—yet all have a common core: how to provide high-capacity anti-friction performance in minimum space at low cost. The fact that the Needle Bearing has become "standard equipment" in so many well-known products is testimony to the knowledge and skill of our engineering staff. They'll literally go out of their way to help you with your problems. Just ask them.

THE TORRINGTON COMPANY
Torrington, Conn. • South Bend 21, Ind.

District Offices and Distributors in Principal Cities of United States and Canada

TORRINGTON *NEEDLE* BEARINGS

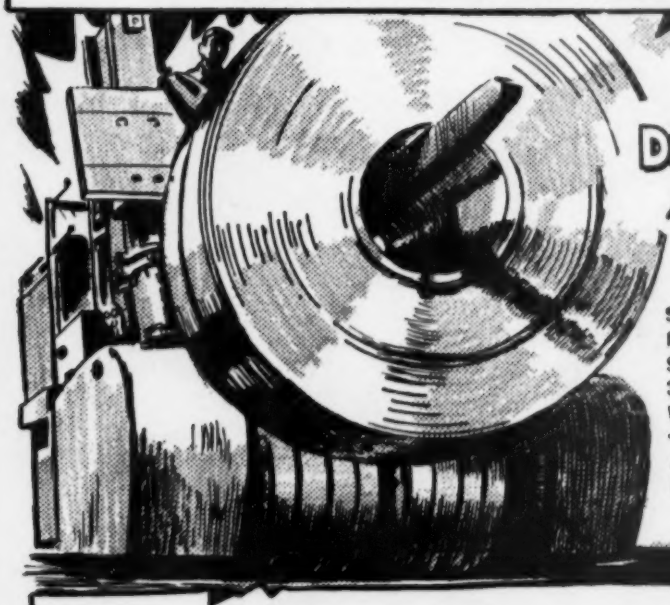
Needle • Spherical Roller • Tapered Roller • Cylindrical Roller • Ball • Needle Rollers

These features make the **TORRINGTON NEEDLE BEARING** *unique*

- low coefficient of starting and running friction
- full complement of rollers
- unequalled radial load capacity
- low unit cost
- long service life
- compactness and light weight
- runs directly on hardened shafts
- permits use of larger and stiffer shafts

FACTS ABOUT Exide®

IRONCLAD® INDUSTRIAL TRUCK BATTERIES

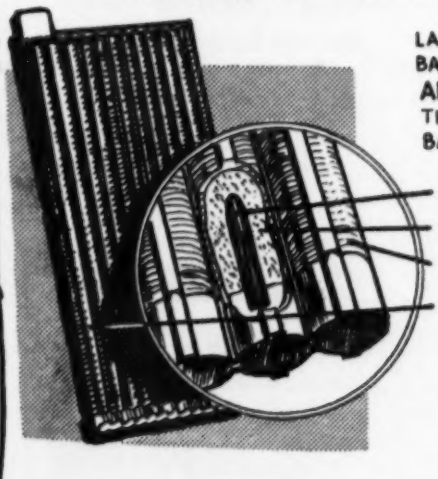


DOING A GIANT'S WORK AT LOWEST COST WITH EXIDE-IRONCLADS

STEEL MILLS USE GIANT **EXIDE-POWERED** RAM TRUCKS TO HANDLE HUGE COILS OF SHEET STEEL WEIGHING AS MUCH AS 30 TONS EACH. THEY WORK FULL-SHIFT WITHOUT COSTLY DOWN-TIME DELAYS -AROUND THE CLOCK. **EXIDE** DEPENDABILITY AND EXCEPTIONALLY LONG USEFUL LIFE RESULTS IN LOWEST HANDLING COSTS PER TON.

BATTERIES ARE WORKED TO DEATH BY EXIDE ENGINEERS TO LEARN SECRETS OF LONGER LIFE

SINCE 1910, RESEARCHERS HAVE GREATLY IMPROVED EXIDE-IRONCLAD PERFORMANCE AND USEFUL WORKING LIFE, BUT THE BASIC IRONCLAD PRINCIPLE OF TUBULAR CONSTRUCTION REMAINS THE SAME.



- PROTECTED CONDUCTING GRID
- COMPRESSED ACTIVE MATERIAL
- SLOTTED RETAINER TUBE
- IRONCLAD POSITIVE PLATE

LAB TESTS OF IRONCLADS AGAINST CONVENTIONAL TYPES OF BATTERIES SHOW THAT THEY GIVE BETTER PERFORMANCE... AND FROM 20% TO 30% LONGER LIFE! THESE TWO FACTS, DEMONSTRATED BY THOUSANDS OF BATTERY USERS, ARE THE REASON WHY...

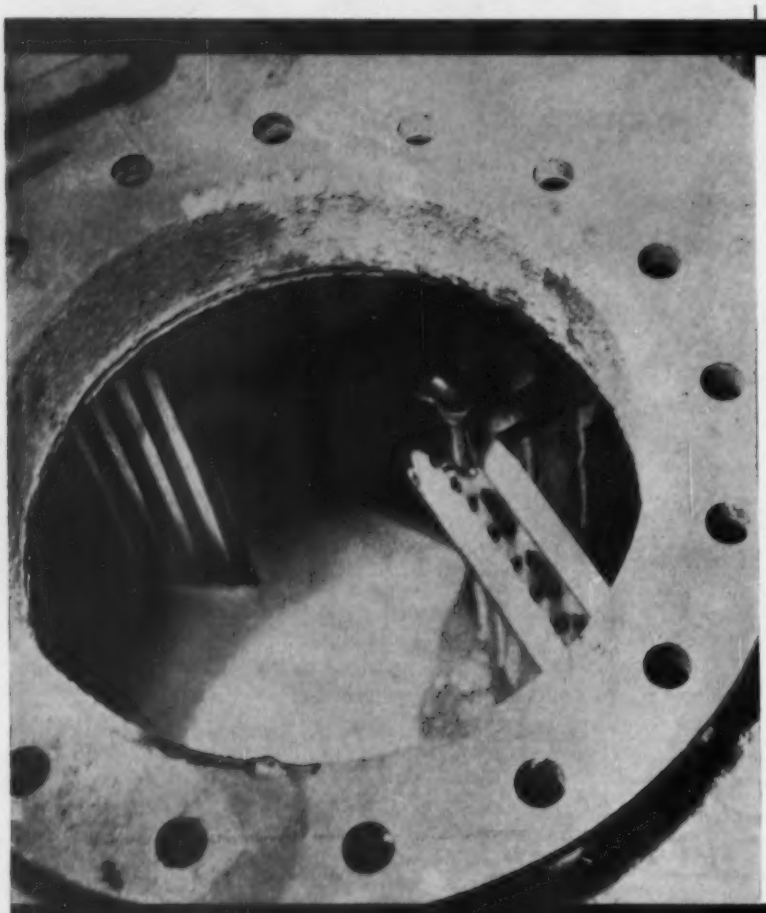
EXIDE-IRONCLADS ARE YOUR BEST POWER BUY **AT ANY PRICE!**

LET EXIDE HELP SOLVE YOUR INDUSTRIAL TRUCK BATTERY PROBLEMS ❶ CALL AN EXIDE SALES ENGINEER FOR FULL DETAILS ❷ WRITE FOR FORM 1982, A MANUAL ON INSTALLING AND MAINTAINING MOTIVE POWER BATTERIES

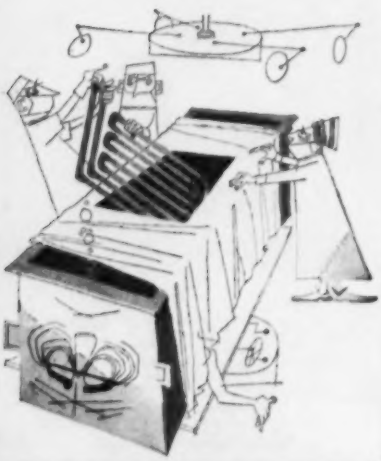
Exide INDUSTRIAL DIVISION, The Electric Storage Battery Company, Philadelphia 2, Pa.

new PLATECOILS®

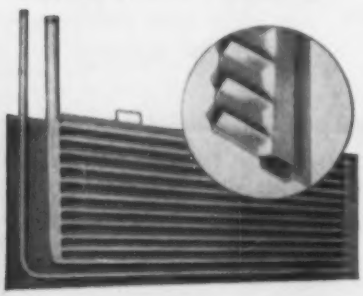
cost less than pipe coil repairs...



as Coil-itis* is cured in this Sherwin-Williams agitated tank



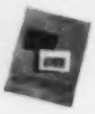
Platecoils have replaced a large circular pipe coil formerly used to cool alkaline slurry in an agitated tank at Sherwin-Williams Company. Installed on end, Platecoils are inserted or withdrawn through a manhole on the top of the tank. With pipe coils, it was necessary to remove the motor and agitator and the bolted-down tank top to make repairs. Cost of doing this just once exceeded the total cost of the 6 Tranter Platecoils now used. In addition, cooling is now accomplished without fouling of surface, which means the cooling is more effective and maintenance is decreased. Such outstanding savings are possible with Platecoils. Investigate them for your processes today. For heating as well as cooling, Tranter Platecoils are your best answer.



PLATECOILS *replace pipe coil for 50% of the cost*

*Besides reducing original costs, Tranter Platecoils frequently save 50% in maintenance costs. And production time is saved because Platecoils heat or cool 50% faster and payloads are increased because Platecoils take 50% less tank space. By overcoming the limitations of old-fashioned pipe coils, Platecoils cure Coil-itis.

Write today for a 12-company report on savings made by use of Tranter Platecoils. Ask for Bulletin No. P73.



PLATECOIL Div. TRANTER MANUFACTURING, Inc., Lansing 4, Michigan

Improve ladle additions of chromium to steel with ELECTROMET Exothermic Ferrochrome

LOW CARBON PICKUP

ELECTROMET Exothermic Ferrochrome 8, which has a 12 to 1 chromium-to-carbon ratio, gives a carbon pickup of 0.08% for each per cent of chromium added. ELECTROMET's new Exothermic Ferrochrome 5, having a 20 to 1 chromium-to-carbon ratio, gives only about 0.05% carbon pickup for each per cent of chromium added.

HIGH CHROME RECOVERY

About 92% of the chromium is recovered regularly. This provides close control of chromium specifications in the finished steel with a minimum loss of alloy.

FAST SOLUBILITY

ELECTROMET exothermic ferrochrome generates the right amount of heat to melt the alloy quickly and prevent chilling the metal in the ladle.

Other advantages of ELECTROMET'S Exothermic Ferrochrome:

High ignition temperature (above 750 Deg. F.) gives maximum protection against fire hazard during storage.

For convenient, easy handling the alloy is packed in cans, or in strong, flameproof and moisture-proof bags. Cans or bags are shipped on pallets at customer option. Each pallet holds 60 cans or 80 bags.

No weighing is necessary since each can or bag holds exactly 25 lb. of contained chromium. Just count the cans or bags to obtain the weight desired.

FREE TECHNICAL ASSISTANCE . . . in the use of the material is furnished by ELECTROMET's experienced field representatives. Further information will be gladly furnished on request. Please contact one of the offices listed below.

The term "Electromet" is a registered trade-mark of Union Carbide and Carbon Corporation.

ELECTRO METALLURGICAL COMPANY

A Division of Union Carbide and Carbon Corporation

30 East 42nd Street UCC New York 17, N. Y.

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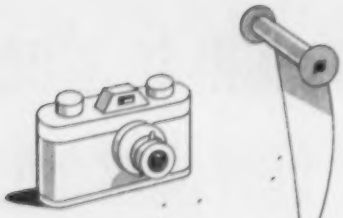
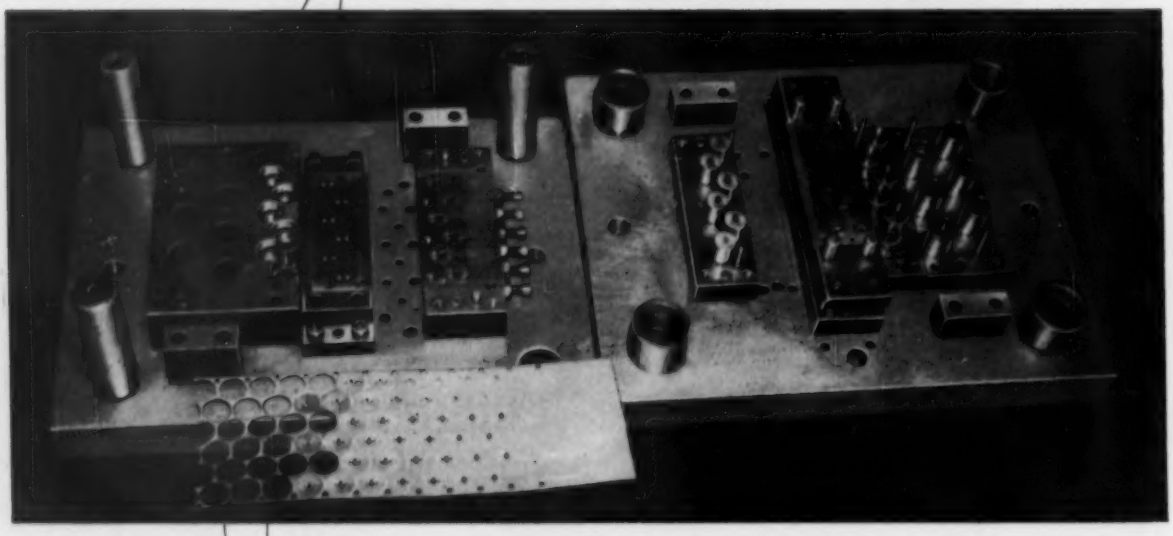
Electromet

TRADE MARK

Ferro-Alloys and Metals



Over 150 Million Stampings from this ONTARIO Die



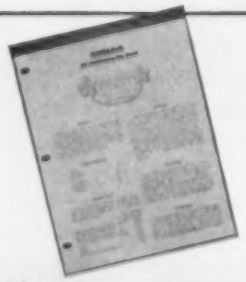
600,000 Film Spool Flanges PIERCED, EMBOSSED, STAMPED and BLANKED per Grind

Production engineers at an eastern camera manufacturing plant have reported excellent results from their Ludlum Ontario film-spool-flange die. The Ontario die performs the multiple operations of piercing, embossing, stamping, and blanking.

Operating at 130 strokes a minute, the big die has produced over 150,000,000 parts. Runs as high as 600,000 have been made between grinds. For this operation, Ontario is air cooled from a temperature of 1850 F, then tempered at 350 F for six hours. This results in a Rockwell C hardness of 60-62.

Ludlum Ontario is an air hardening die steel of the high carbon/high chromium type. It has all the desirable properties of such steels—resistance to abrasion, high hardness and excellent non-deforming characteristics. In addition, it is tougher but easier to machine than the higher carbon/high chromium types which are usually oil hardening.

For the finest in tool steel to help solve your cutting, forming, or blanking problems, call your nearest A-L office or distributor today, or write *Allegheny Ludlum Steel Corporation, Oliver Building, Pittsburgh 22, Pennsylvania.*



Write for your
ONTARIO BLUE SHEET

A concise 4-page booklet of facts on the handling and shop treatments of Ontario. Included is complete information on forging, annealing, tempering, etc. and detailed laboratory data on physical characteristics. *Ask for your free copy.*

Address Dept. A-62

For complete **MODERN** Tooling, call

Allegheny Ludlum

WBD-8348

AL
FINE TOOL STEELS SINCE 1854

WILLIAMS-WHITE *Machinery for* BENDING, FORMING, FORGING, PUNCHING, SHEARING OPERATIONS

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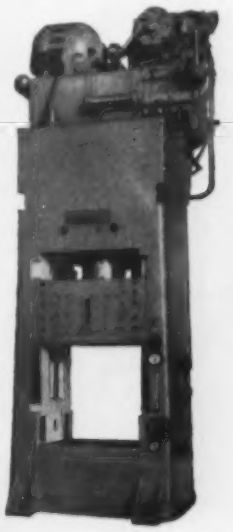
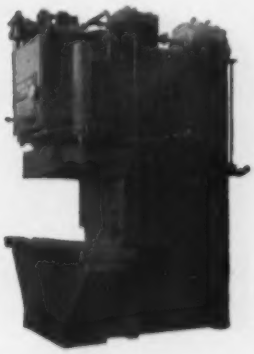
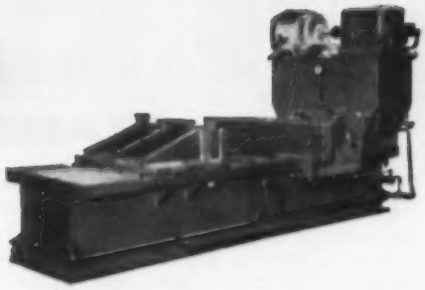


At right: 500-Ton Hydraulic Housing Press: Bed and ram area, 48 x 48 in.; Daylight opening, 54 in.; Stroke, 36 in.; Drawing speed, adjustable; Hydro-pneumatic die cushion.

Below: 500-Ton Hydraulic Gap Frame Press: Platen surface, 24 x 96 in.; Throat, 18 in.; Daylight opening, 30 in.; Stroke, 24 in.



Below: 600-Ton Column Moving Up Hydraulic Press: Platen surface, 42 x 60 in.; Daylight opening, 24 in.; Stroke, 12 in.



At right: 200-Ton Hydraulic Bulldozer, with adjustable end lug. Die space, 36, 48 and 60 in.; Stroke, 24 in. Foot button or treadle control.

WILLIAMS-WHITE Machines are well known for quality all over the world. All are custom built to meet your specifications. 100 years of building high quality machinery brings a wealth of experience to every problem of design and construction. Our staff of engineers and designers is at your service. Simply write and tell us your requirements . . . we will be glad to send you our recommendations with no obligation on your part.

Builders of Quality Machinery For Over 100 Years

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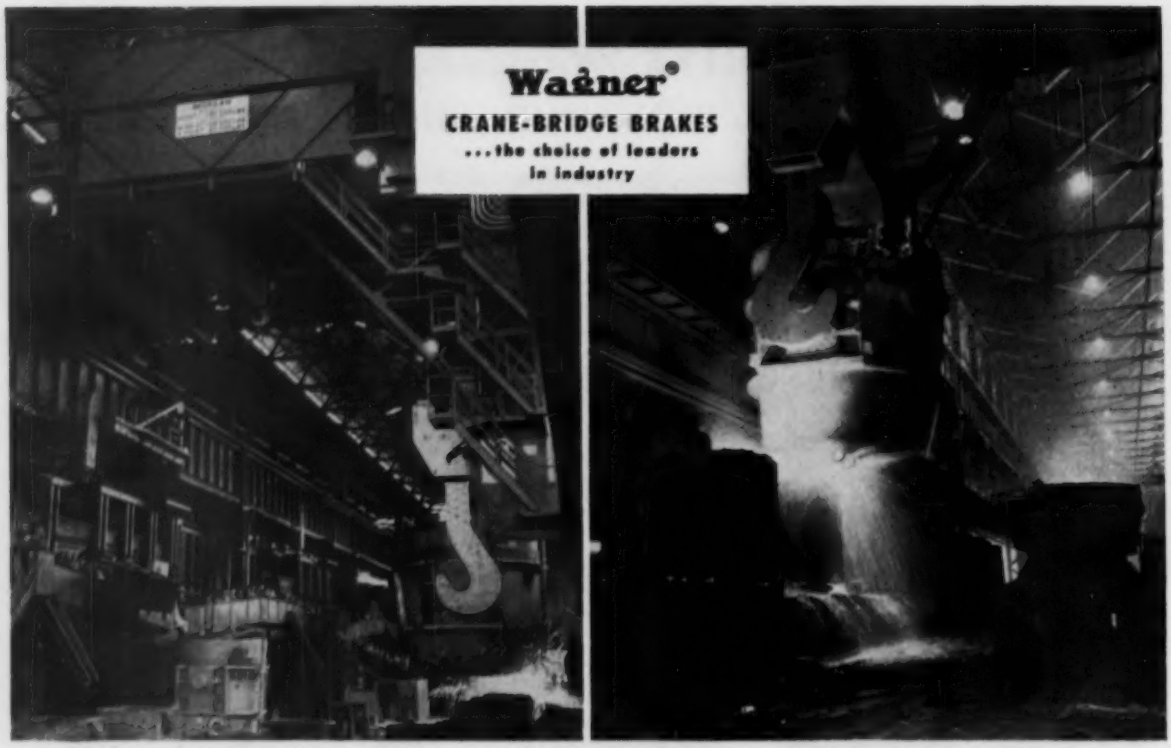
302 EIGHTH ST. • MOLINE, ILLINOIS • EST. 1854



STOPPED...RIGHT ON THE BUTTON with Wagner Powered Hydraulic CRANE BRIDGE BRAKES

The cranes in the picture above are installed at Jones & Laughlin Steel Corporation's Open Hearth No. 4.

The ladle-carrying crane is "spotted" over the molds by Wagner *Powered* Hydraulic Crane Bridge Brakes, one of which is shown in the inset below.

Leaders of industry such as Jones & Laughlin have installed Wagner Crane Bridge Brakes because they're:

SAFE... cranes can be controlled without bridge motor plugging and the resultant damage to both motor and gears... parking brakes set automatically to bring the crane to a gradual stop in case of power failure.

EFFICIENT . . . Wagner Crane Bridge Brakes allow close spotting where frequent stops and starts are necessary... a self-centering device prevents brake shoe drag by automatically clearing the brake shoes.

EASY-TO-OPERATE . . . tip-toe braking . . . finger-tip parking . . . one-minute bleeding.

ECONOMICAL . . . operators are less likely to drag brakes so there is less wear on wheels and lining . . . the life of your equipment is prolonged . . . several brakes can be operated from one pedal . . . it is easy to step up production.

Wagner power units can be added to your present Wagner Hydraulic System. Only six weeks are required to fill the average order. Bulletin IU-36 gives full details —write for your copy today.

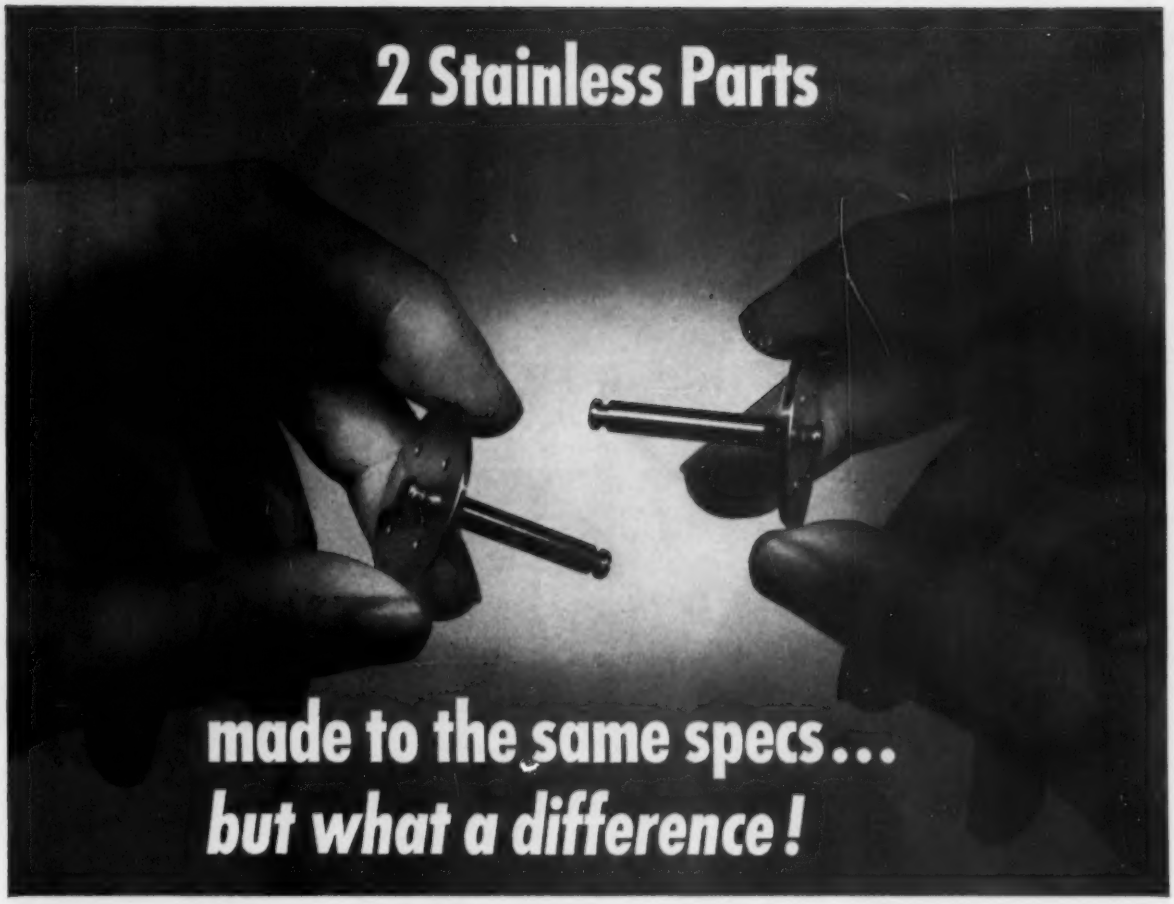
Wagner Electric Corporation
EST. 1891

WAGNER ELECTRIC CORPORATION
6403 PLYMOUTH AVE., ST. LOUIS 14, MO., U.S.A.

BRANCHES AND DISTRIBUTORS IN ALL PRINCIPAL CITIES

ELECTRIC MOTORS
TRANSFORMERS
INDUSTRIAL BRAKES
AUTOMOTIVE
BRAKE SYSTEMS—
AIR AND HYDRAULIC

159-I



Machining costs are 25% lower

This valve is used for a fuel return regulator check. Although the manufacturer was one of the first to use Carpenter Stainless No. 8 (Type 303) when it was first introduced, there have been occasions and conditions which required the use of ordinary makes of Type 303 Stainless Steels. The customer reports: Carpenter No. 8 *consistently* enables them to show a 25% saving in machining costs because of its constant uniformity and easier machinability.

Reject rate is reduced

An important requirement of this valve is that it be "leak-proof" in operation under pressure. To assure a tight seal, some surfaces are machined to a 5 or 10 micro-inch finish with tolerances as close as .0005". Because of the machinability and finishes obtained with Carpenter No. 8, rejects always take a sharp drop when compared with competitive Type 303 Stainless Steels.

Machine operators are happier

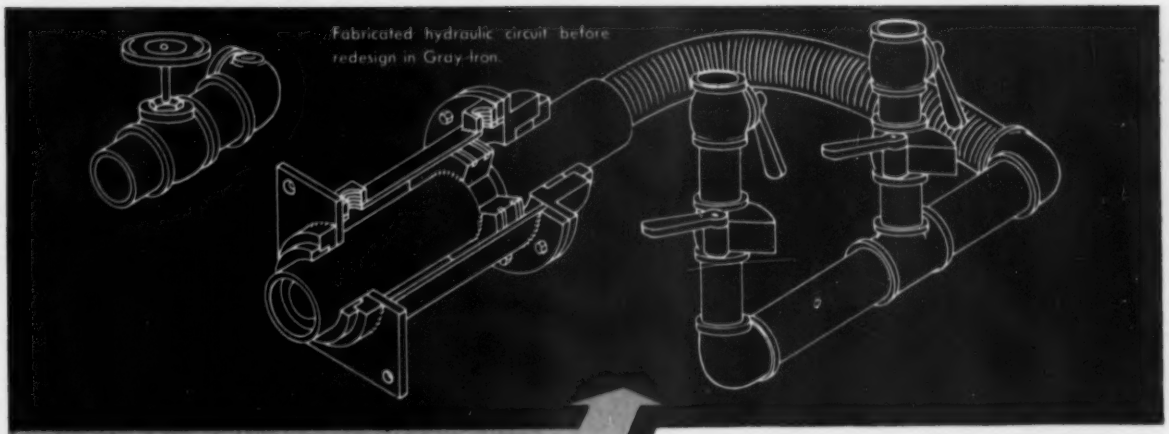
Here's an interesting sidelight: Machine operators can always spot an ordinary Type 303 without being told, because of the way it cuts in the machines. With Carpenter No. 8 they tell us they *know* the job will run smoother and faster with improved results. The same thing can apply in your *own* plant. So if you're looking for a way to improve performance and reduce costs on your stainless parts, CHANGE to Carpenter No. 8. See what the difference can mean to you. THE CARPENTER STEEL CO., 121 W. Bern St., Reading, Pa.

take the problems out of production

...change to Carpenter STEEL

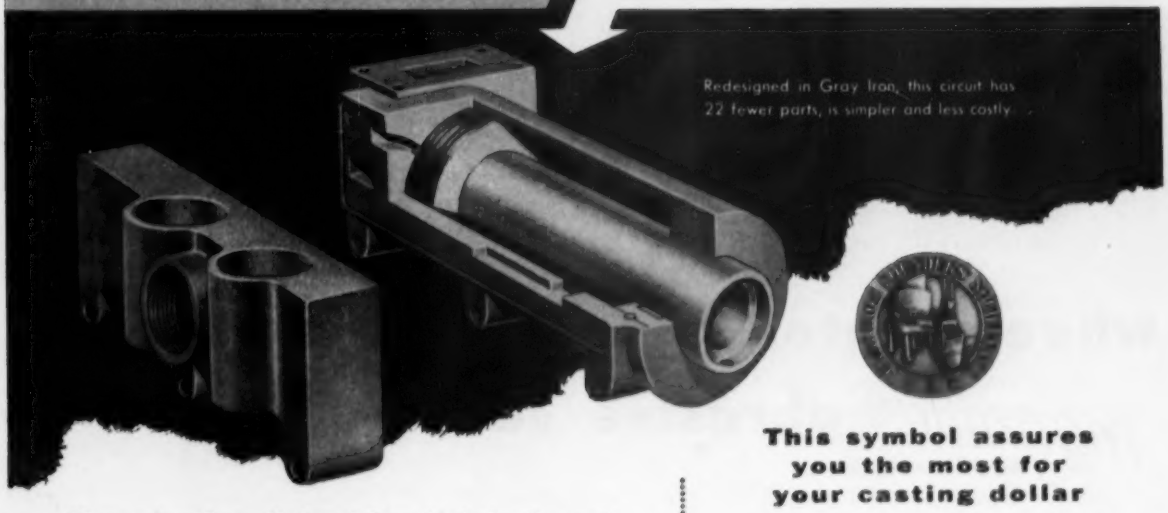
Free-Machining Stainless

IMMEDIATE DELIVERY from local warehouse stocks!
Export Department: The Carpenter Steel Co., Port Washington, N.Y.— "CARSTEELCO"



Fabricated = 35 Parts

Cast in Gray Iron = 13 Parts



22 parts have been eliminated from this hydraulic circuit by redesigning in Gray Iron. The cast unit is compact, more efficient and less costly. It has done away with many external connections and all welding and pre-weld preparation formerly required.

Many such important savings are inherent in the Gray Iron casting process as compared with fabricated assemblies. Consider Gray Iron's unique engineering advantages in redesigning your products.

Call your nearest Society member foundry and the full facilities of this association will be available to you. Or, write direct to Gray Iron Founders' Society, Inc., National City-E. 6th Bldg., Cleveland 14, Ohio, for helpful technical and business information.

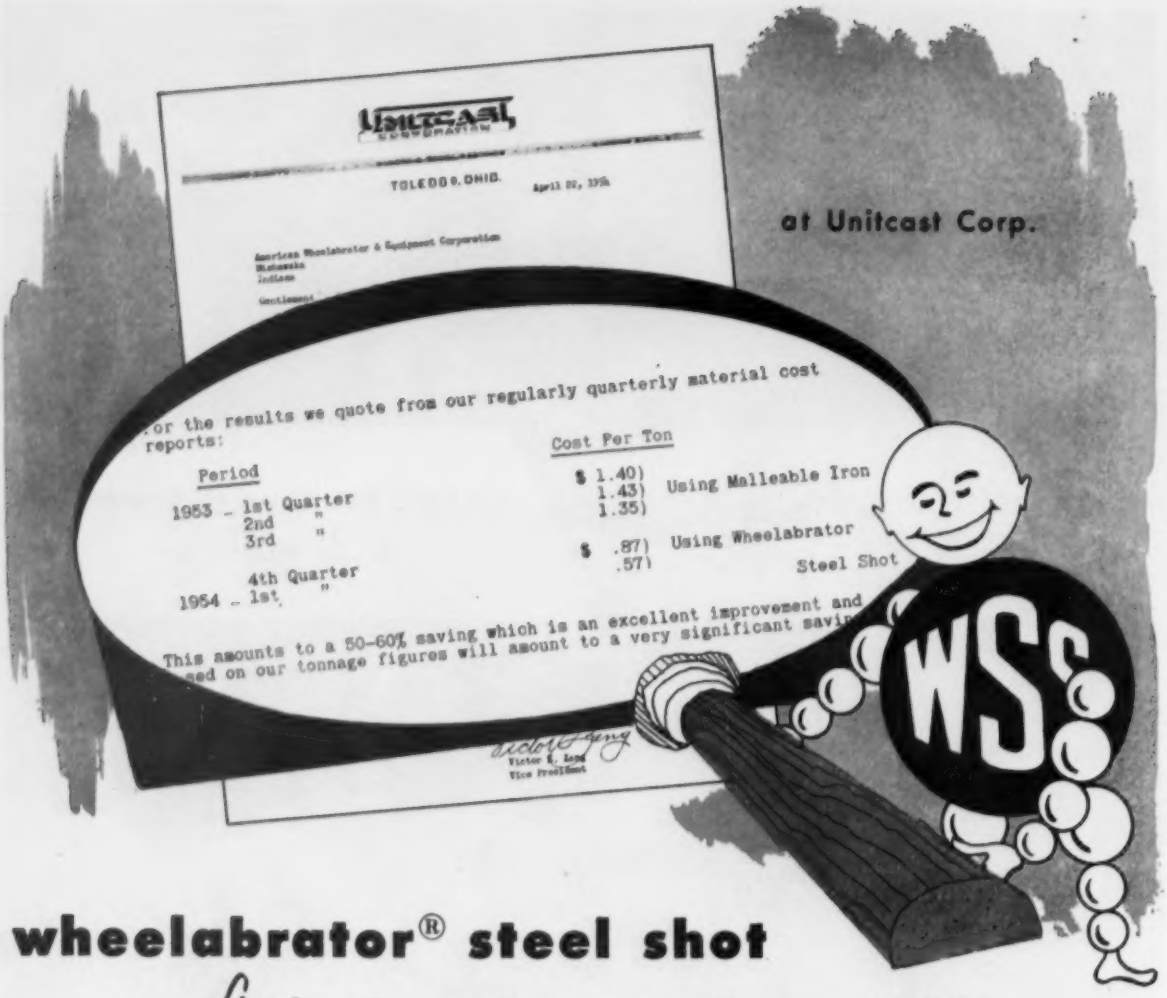
This symbol assures you the most for your casting dollar

Here's why it pays to call in one of the more than 500 leading foundries displaying the Society symbol:

- The most recent technical and business information is available to each member through the Society to help you design better products at lower cost.
- The use of sound cost accounting procedures is recommended and encouraged among Society member foundries, assuring full value for your casting dollar.
- Improved castings result from the advanced techniques and the high sense of responsibility of Society members.

MAKE IT BETTER WITH GRAY IRON

GRAY IRON FOUNDERS' SOCIETY



wheelabrator® steel shot *magnifies* abrasive savings 60%

Every ton of castings cleaned at Unitcast Corp. magnifies the savings this Toledo firm has made by switching from a malleableized abrasive to Wheelabrator Steel Shot.

Abrasive costs per ton of material cleaned have dropped from $1.43 to 57c — a saving of 86c a ton by using Wheelabrator Steel Shot. This saving grows to $86 for every 100 tons cleaned. It means $1 spent for Wheelabrator Steel Shot buys as much cleaning as $2.50 spent for malleable iron abrasive.

The hardness of Wheelabrator Steel Shot (42 to 50 Rockwell C), its toughness, native impact strength, and rebound properties guarantee you more for your abrasive dollar when you use this superior electric furnace steel shot. Why not try it yourself? For complete details, write for Bulletin 89-B.

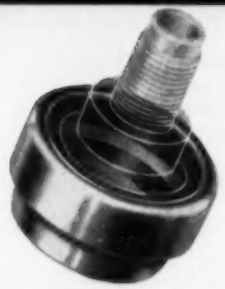
American WHEELABRATOR® *trail blazer of industrial progress*

AMERICAN WHEELABRATOR & EQUIPMENT CORP., 510 S. Byrkit St., Mishawaka, Indiana

THE "Jet" OF FREE-MACHINING STEELS

. . . . . B&L LEDLOY
COLD FINISHED LEADED BARS

CASE HISTORY OF A LEDLOY VALVE PART



In fabricating this Vernatherm element from 1-15/16" Rd., several types of steel were tried from B-1113 to C-1144. On Bessemer, rejections ran as high as 35% due to cracks developing in forming the rim. Use of C-1137 to C-1144 overcame this, but machine time jumped to 56 seconds per piece. By changing to B&L LEDLOY "A", time per piece reduced to 26 seconds, with increased speeds from 200 SFM for B-1113 to 285 SFM for LEDLOY. Tool life increased; rejections eliminated. Finished part tested 4600 psi without permanent set.

This Super-Machining Lead-Bearing Steel has been developed to give maximum cutting speeds and feeds on modern high-speed automatics. It enables you to obtain the ultimate output, day after day, that your screw machine equipment is capable of delivering.

B&L mills produce quality Cold Finished Bars in LEDLOY Grade "A" and "B" as well as plain carbon grades and special alloy steels. You will find these are time-saving substitutes for either Bessemer or Open-Hearth Screw Stocks and that they offer big advantages over similar non-leaded steels.

Many users of B&L LEDLOY Bar Steels report these outstanding results: Production increases of 50% to 90% without sacrifice of quality . . . Time savings of 33% to 55% in fabricating unit parts . . . Longer tool life . . . Minimum rejections . . . Improved finish . . . and excellent mechanical properties.

Production-wise, B&L LEDLOY Bar Steels give you a wide leverage in cutting the costs of machine products. Try an order of B&L LEDLOY on your next important machining job.

BLISS & LAUGHLIN, INC.

GENERAL OFFICES: HARVEY, ILLINOIS

SALES OFFICES IN ALL PRINCIPAL CITIES

FOUR PLANTS:—

HARVEY, ILL.

DETROIT, MICH.

BUFFALO, N. Y.

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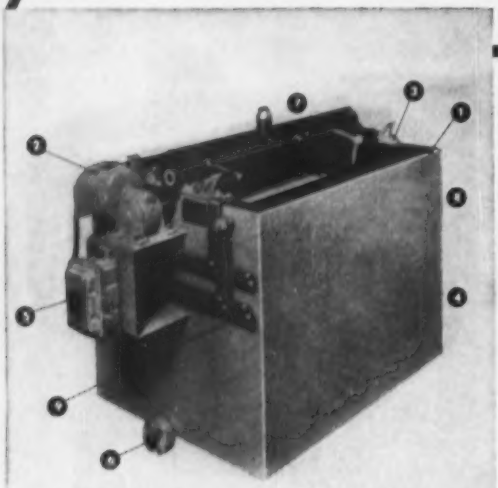
this improved H-VW-M
MERCIL-TYPE PLATING TANK
with SUBMERGED CYLINDER

plates faster
reduces maintenance cost
permits larger loads

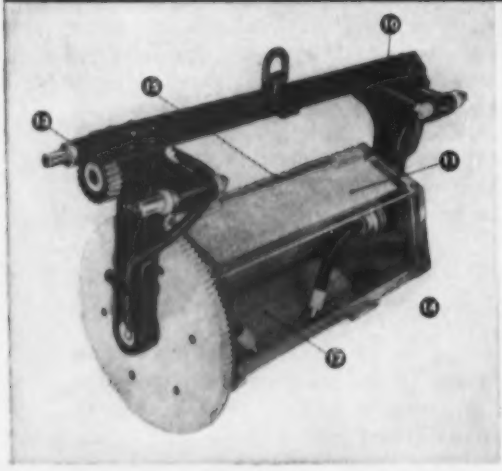


by combining *all* these features for better barrel plating:

1. **TURNED-IN FLANGES**—save space, provide enclosure for hanging heating and cooling coils.
2. **RELOCATED, MORE COMPACT MOTOR DRIVE**—drive shaft *now* above solution level, preventing leakage through shaft openings in tank walls.
3. **REDESIGNED SADDLES**—make barrel positioning far easier.
4. **NO OVERFLOW TROUGH**—not essential with this improved design, saves space inside tank.
5. **PUSH-BUTTON TYPE MOTOR STARTER**
6. **BOTTOM DRAIN**
7. **COIL RISERS**—extending over top of tank.
8. **ANODE RODS**—2 for each cylinder on both single and multiple units.
9. **BUS BARS**—positive and negative on *each* end of tank for equal current distribution.

These *improved* tanks are constructed of ¼" double-welded steel plate in 2 sizes, 14" x 30" I. D. (224 gal.) and 14" x 36" I. D. (252 gal.). For acid solutions, tanks are lined with ⅜" vulcanized rubber or plasticized PVC. For cyanide solutions, rough-wire glass is used in back of anodes. Finish is rust-resistant grey enamel with black trim.

TOGETHER, *They Form the Ideal Combination for Better Barrel Plating!*



10. **IMPROVED HANGER ASSEMBLY**—now made of rigid angle-iron, improved to insure proper barrel alignment.
11. **ONE-PIECE PANELS**—Plexiglas: ½" thick, no ribs. Melamine: ¼" thick, ribbed.
12. **CONVEX TUMBLING SURFACES (Plexiglas only)**—for added strength, easier tumbling action.
13. **MELAMINE BUSHINGS**—for insulating bronze hanger pins.
14. **EASY LOADING & UNLOADING**—cover with handle in panel area is easily reached at all times.
15. **SECURE BONDING**—all molded parts firmly bonded with cement and monel screws.

These *improved* cylinders are available in either Plexiglas, for temp. to 180°F., or Melamine, for temp. of 200-210°F. (Melamine has excellent resistance to abrasion). Hexagonal in shape, with 1" thick heads and special convex (Plexiglas only) one-piece panels, they are designed for greatly reduced maintenance cost and engineered for use *completely submerged* . . . with outstanding results: more consistent plating, 20% higher load capacities, 25% faster plating. And, in zinc baths, total submersion minimizes chance of spark igniting gas above bath.

For complete information on improved H-VW-M Mercil-Type Tanks and Cylinders ask for Bulletin PB 109.

PLATEMANSHIP

Your H-VW-M combination—of the most modern testing and development laboratory—of over 80 years experience in every phase of plating and polishing—of a complete equipment, process and supply line for every need.

HANSON-VAN WINKLE-MUNNING CO. • MATAWAN, N. J.

Plants: Matawan, N. J. • Grand Rapids, Mich.

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H-VW-M

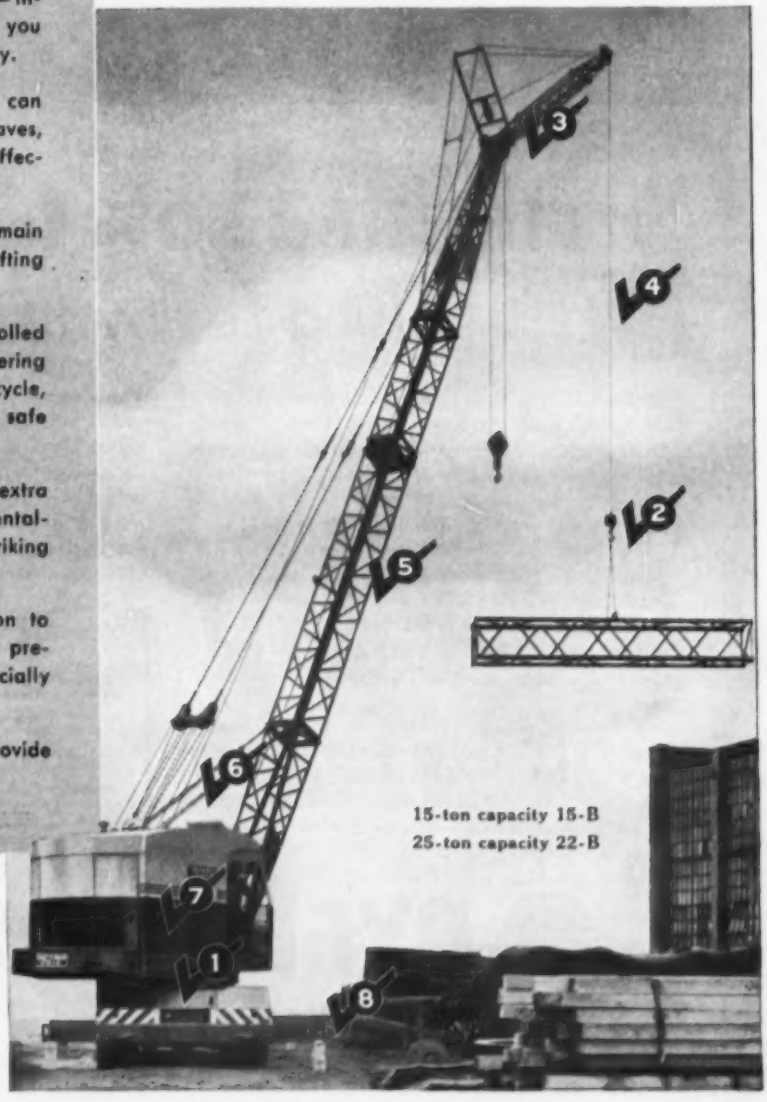
INDUSTRY'S WORKSHOP FOR THE FINEST IN PLATING AND POLISHING PROCESSES • EQUIPMENT • SUPPLIES

Check Mounting Material Handling Costs with Mobile, Versatile, Efficient TRANSIT CRANES

You can gain a big competitive advantage by putting a check on the biggest dollar consumer in your maintenance program—material handling—with a highly mobile, versatile, safe and speedy operating Bucyrus-Erie Transit Crane.

Look over the partial list of efficiency features that work to your economical advantage. Then check with your Bucyrus-Erie distributor for the complete, low-cost material handling story. 74E54

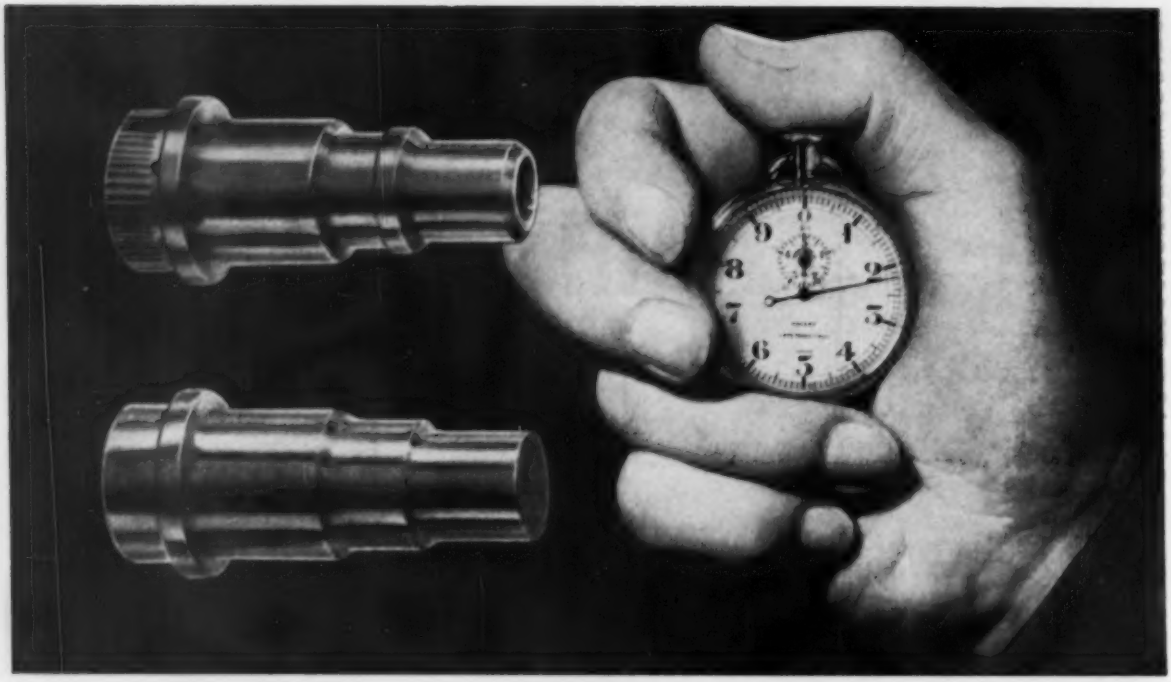
1. Sturdy custom-built carrier with ten forward and two reverse speeds, gives you the maneuverability needed for tight yard operations; its top speed, 31 mph, lets you cover widely scattered jobs in less time.
2. A wide variety of easily attached crane attachments — hook, sling, magnet, grapple, hairpin hook — increases work versatility, lets you handle more jobs more efficiently.
3. Jib extensions (10, 20, or 30-ft.) can be added without removing sheaves, guards or suspension ropes for effective high-lift work.
4. Power controlled lowering on main hoist line means safer, surer lifting and placing of loads.
5. Fully independent power controlled boom hoist provides power lowering of boom at any phase of the cycle, lets you maintain speedy yet safe operations.
6. Telescopic pipe boom-stops for extra safety prevent boom from accidentally snapping over center and striking cab.
7. Friction swing brake, in addition to regular swing lock, facilitates precision spotting of the load, especially when using a long boom.
8. I-beam double-box outriggers provide added stability.



15-ton capacity 15-B
25-ton capacity 22-B

BUCYRUS ERIE

SOUTH MILWAUKEE, WISCONSIN



Finished 50% faster

Using Ledloy from Ryerson

By the time the B-1113 piece was finished, you'd be halfway through a second Ledloy piece. Such greater speeds and feeds are possible with Ledloy because Ledloy contains a *built-in lubricant* which substantially reduces the friction between the steel and the cutting tool.

That built-in lubricant is *lead*—so finely dispersed through this free-machining, open-hearth steel that you can't see it with a microscope. The addition of this small percentage (.15-.35) of lead has no effect on the mechanical properties of the steel EXCEPT to greatly increase machinability.

Ryerson Ledloy machines up to 50% faster than B-1113 . . . tool life is extended as much as 200% . . . and net savings of 25% and more are effected. And Ledloy machines to an unusually clean, smooth finish—case hardens effectively—and bends, crimps, swedges or rivets easily.

Ask your Ryerson representative for the facts about Ledloy or write us direct for engineering data. Ryerson was the first to stock Ledloy and today your nearby Ryerson plant carries the world's largest stocks of Ledloy rounds, squares and hexagons in a wide range of sizes for immediate shipment when you call.

PRINCIPAL PRODUCTS

CARBON STEEL BARS—Hot rolled & cold finished

ALLOYS—Hot rolled, cold finished, heat treated

STAINLESS—Allegheny bars, plates, sheets, tubes, etc.

TUBING—Seamless & welded, mechanical & boiler tubes

STRUCTURALS—Channels, angles, beams, etc.

PLATES—Many types including Inland 4-Way Safety Plate

SHEETS—Hot & cold rolled, many types & coatings

MACHINERY & TOOLS—For metal fabrication

RYERSON CERTIFIED STEELS®

RYERSON STEEL

JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK • BOSTON • PHILADELPHIA • CHARLOTTE, N. C. • CINCINNATI • CLEVELAND
DETROIT • PITTSBURGH • BUFFALO • CHICAGO • MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISCO • SPOKANE • SEATTLE

FORECAST

The Iron Age Newsfront

Scrap: Want Cleaner No. 2 Bundles

A leading scrap consumer has launched a program of education among dealers to improve quality of No. 2 bundles. When poor bundles are received a company inspector visits the dealer's yard, explains quality control problems of the consumer, suggests ways to improve bundling practice. If this fails to get results dealer runs risk of losing a good customer.

Forging Billets Heated In Tube

A radiant tube is being used in reverse by one furnace manufacturer to heat small billets for forging. Billets are pushed through the silicon carbide tubes which are in the furnace chamber. Tubes are heated from the chamber side. Protective atmosphere is introduced inside the tubes to protect billets from scale.

Industry Uses More Packaging Materials

Near record output of industrial containers is forecast for 1955. And last year's production was only 5 pct below the peak level of 1953. Government experts believe manufacture of pulp, paper and paperboard packaging materials will hit an all-time high of at least 27 million tons during 1955.

MSTS Gets New Cargo Ship Design

Preliminary design of a new vehicle cargo ship for Military Sea Transportation Service has been completed. Despite large hatches and topside cargo gear, it will have space for 450 vehicles of passenger-car size, or for enough general cargo to fill about 200 boxcars.

Take A Look At Punched Angles

Punched and slotted angle stock is attracting considerable attention for use in quick construction of frames for shelves, racks, tables, ladders and small buildings. Now a one-third scale angle stock, with alternate round and elongated holes, similar to full size stock, is planned for visual engineering purposes and home workshop use.

Latest UMT Plan: Opposition Expected

Latest blueprint for universal military training may get lost in the Capitol Hill shuffle. It would put another 100,000 youths into uniform, train them for 6 months place them in the reserve for 9½ years. Some businessmen are expected to argue against this heavier drain on new manpower.

New Entry In Titanium Derby

One of the big three aluminum producers may add titanium to its product line. If it can lick the ingot casting problem, there is a strong likelihood it will enter the field, possibly converting purchased sponge to mill products.

1956 Auto Tooling: Facelifting Changes

While automobile production is off to a fast start in 1955, the 1956 tool and die program is spotty. Almost without exception changes in 1956 models will be confined to a facelift.

Continuous Casting Moves Ahead Abroad

Continuous casting of steel is moving ahead rapidly outside the United States. In addition to the Atlas Steel Plant in Canada, plants are reported operating in England, Sweden, France and Yugoslavia, Germany and Austria. Installation of a continuous casting machine in Japan in the near future is also expected.

Body Stylists Want Sliding Doors

Sliding doors for passenger cars have often been discussed in Detroit but as yet no way has been found to do the job satisfactorily within cost and car safety limitations. The subject continues to get some deserved attention by passenger car stylists, however.

Vacuum Cast Large Forging Ingots

Forging ingots weighing up to 150 tons and intended for use in shafts and rotors of power generating equipment are now being vacuum cast in Germany. The method yields hydrogen-free ingots without the usual long, slow cooling.

a CMP cost cutting report

ON THIS DRAWN METAL PART...

CMP COLD ROLLED STRIP STEEL

(NON-SCALLOPING QUALITY)

eliminated earing and an extra operation .... stepped up production

BEFORE

Buying a standard specification cold rolled strip steel this manufacturer had several fabrication problems. Needing a precision assembly fit with other components, they frequently had runs of many rejects and production slow-downs. Inspection costs for in-process fabricating was excessive. Each unit, after drawing, also required an additional trimming operation to remove the ears. Because of the uniformity needed, costs were running out-of-line and the added manual work to reclaim rejects was further increasing costs.

AFTER

First, a suggestion from a CMP representative gained interest and established several meetings with production and engineering to consider the CMP proposal. Several test runs were made with the non-earring CMP specification steel developed specifically for this job. It worked wonders. the trimming operation was eliminated completely and a precision quality for uniformity was established. A close, dependable assembly of components was made possible, eliminating the "re-work" line entirely. Rejects were reduced to an absolute minimum. Perhaps you could improve your product and production, too, with CMP "specific specs" cold rolled strip steel — we will be glad to work with you.

CMP . . .
WHERE YOU CAN GET SPECIFIC SPECS. FOR SPECIFIC JOBS

LOW CARBON
HIGH CARBON
Annealed or Tempered
STAINLESS
ALLOY
ELECTRO ZINC COATED

the Cold Metal Products co.

GENERAL OFFICES: YOUNGSTOWN 1, OHIO
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LOW CARBON, HIGH CARBON (Annealed or Tempered), STAINLESS AND ALLOY GRADES, ELECTRO ZINC COATED ARE AVAILABLE FROM:

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THE KENILWORTH STEEL CO., 750 Boulevard, Kenilworth, New Jersey
Phones: N. Y., COrtlandt 7-2427; N. J., UNionville 2-6900

PRECISION STEEL WAREHOUSE, INC.
4425 W. Kinzie, Chicago — Phone : COlumbus 1-2700

RESEARCH: Aims at $2 Billion Paint Tab

American industry picks up a staggering $2 billion tab each year for maintenance painting . . . Battle against corrosion so costly many firms have set up research programs to help fight it—By *J. B. Delaney.*

◆ AMERICAN industry picks up a staggering $2 billion tab each year for maintenance painting.

The battle against corrosion is such a costly headache that many companies have set up their own research and test programs to evaluate hundreds of paint systems under conditions peculiar to their operations.

They are finding the rewards worth the effort. More than one company has been able to save 30 pct or more in painting costs alone, plus the additional benefits of better maintenance, base metal and equipment savings and less product contamination. An intangible but important reward has been improvement in paint crew morale.

Raised Paint Life

If you have been accepting paint maintenance costs as an inevitable something you could do little about, take heart. The same scientific approach that has licked other industrial problems is being used to slash the paint budget and produce a better job to boot.

For example, a large chemical company has succeeded in boosting the life of its average paint job from 1 year to 3 years. In the first 9 months of its test program it discarded an inferior paint system it had been using. This one change produced enough savings to pay the cost of the program.

An example of what's happening in the steel industry is the program now underway at Jones & Laughlin Steel Corp. in cooperation with Kenneth Tator Associates of Coraopolis, Pa., consultants.

J. & L.'s research is being carried out at its Pittsburgh Works but the results will be of company-wide benefit since atmospheric corrosion problems at other plants have many similarities.

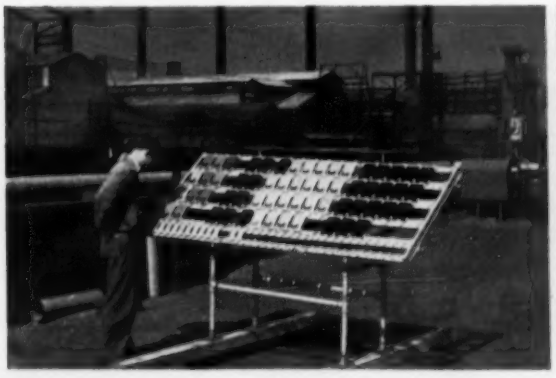
Of three test methods available, J. & L. decided to use a system developed by Tator which has proved reliable in evaluating performance of various coatings in "problem" areas in industrial and chemical plants throughout the country.

An important difference between the Tator method and other paint evaluation systems is in design of test panels. Instead of the usual plane surface panel, the KTA panel consists of a flat steel base on which has been welded a small section of bar channel. Every conceivable surface irregularity encountered in normal service is built into the panel—impact injury, crevices, pits, welds, round edges, sharp edges, severe planes, representative planes, scratches, prominences, and water and soilage pocket.

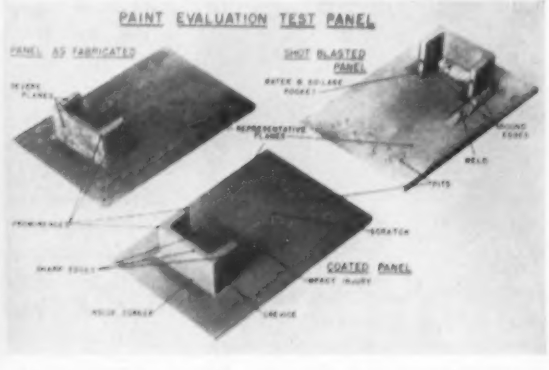
J. & L. is testing some 50 paint systems through approximately 400 test panels spotted at strategic plant locations. It conducts its evaluations in three stages:

(1) Coatings are applied over an ideal, sandblasted surface to determine their resistance to blistering, cracking, peeling, chalking, and the protection they offer against rusting. Obviously inferior coatings are eliminated in this step.

(2) Coatings that survive test No. 1 are applied to wire-brushed,



TYPICAL paint coating test panel setup shows how Jones & Laughlin checks corrosion resistance of different paints.



ALL conceivable surface irregularities encountered in service are embodied in test panel devised by KTA.

rusted panels and are re-exposed.

(3) Coatings still in the running after the second step are then tested for compatibility when applied over paint in service.

Panels painted with coatings which have been in use in the test areas serve as controls.

"At first glance," says J. & L., "such a thorough testing program might appear overly time-consuming. But reliably accurate performance comparisons can be made in a relatively short time.

"And, because the tests are performed under actual service conditions, results are final and can be applied directly. Another outstanding advantage of this practice is that any number of different coatings may be evaluated and screened simultaneously."

Here are some conclusions reached by Tator and other authorities with regard to maintenance painting:

- Paint thickness is important. For best results it should be at least five mils, applied in three coats, including primer.
- Painting over rusty steel can be costly; costs can be increased from 40 to 60 pct.
- Solving severe exposure problems may not be as complicated as it seems at first glance. Different combinations can be classified down to 15 basic exposures.

A controversial subject at the moment is whether mill scale provides a good base for paint. Despite contrary opinion, Tator contends that mill scale is a poor base and likely to lead to trouble due to scale particles flaking off and exposing the metal underneath.

EXPOSED to ammonium sulfate atmosphere for 13 months, test panel shows severe attack to sharp edges, severe planes and crevices; less severe attack on scratches and impact injury.

Instruments:

Makers see sales increase again for this year.

Makers and distributors of scientific instruments and apparatus are voicing high optimism for their industry's 1955 sales volume. Reason for cheer is present $4 billion investment in American research, startling futures for nuclear and solar energy, and population increases at the rate of nearly 54,000 per week.

Based on an 11 month comparison with 1953 sales, data released by Scientific Apparatus Makers Assn. shows continued strong 1954 sales by laboratory equipment makers with the only sales drop in industrial instruments. Explaining the industrial instrument sales drop of 12.5 pct in 1954, Kenneth B. Andersen, SAMA executive vice-president, points out that the figure reflects a falling off of sales for various electronic testing instruments.

Imports Cause Concern

The instrument industry as a whole is progressing favorably according to Andersen particularly because of the continued emphasis on automation or automatic process controls.

Major concern of instrument and equipment makers is problem of increased imports and lowered tariffs. They say defense considerations dictate preservation of facilities and skills for research activity. Citing the loss of 1500 skilled workers in the scientific optical industry due to a drop in domestic sales, they warn the industry must be kept strong for a possible "battle of the laboratories."

Plastic Pipe:

National Tube ships first 2 in., 3 in. plastic pipe.

First shipment of 2-in. and 3-in. plastic pipe for use in mine drainage operations has been made from Gary plant of U. S. Steel Corp.'s National Tube Div. Construction of National Tube's plastic pipe plant began last June and production started Oct. 1.

Initial production is from polyethylene in sizes ½ in. to 6 in. Manufacturing facilities include screw-type extruders, auxiliary and testing equipment, which will eventually permit the manufacture of pipe from other plastic materials and in a greater size range. A continuing program of research and development is being conducted at the plant with new and improved plastic materials and processing techniques.

National Tube's entrance into the plastic pipe field is the culmination of a 4-year program of market research and technical development.

Epoxies Bump Solder

Araldite 115, an epoxide resin, may be substituted for soft solder in producing bomb-tail assemblies and save about 50 pct of the cost of this work, the Army finds.

As described in a new Army research report, the resin has excellent metal-to-metal bonding qualities and also permits a reduction in the use of the solder components, tin and lead.

In Army tensile tests of Araldite 115 that had been stored in desert, tropical, and arctic situations, the resin proved equal in strength to soft solder.

Office of Technical Services, U. S. Commerce Dept., sells the report as Order PB 111445, *Investigation of Adhesives: Metal-to-Metal Bonding*. Its price is 50¢ per copy.

STEEL: Earnings Dip 9 Pct in '54

Though steel production last year tumbled more than 20 pct, earnings slipped only 9 pct . . . Inland net sets company record . . . Industry-wide modernization minimized earnings drop—By W. V. Packard.

◆ STEEL INDUSTRY earnings in 1954 were only 9 pct less than the excellent level of 1953 — even though production fell more than 20 pct. One company, Inland Steel Corp., set an alltime earnings record in 1950.

This is the highlight of an IRON AGE compilation of steel earnings by companies accounting for the bulk of the industry's ingot capacity.

The relatively good showing in earnings was due largely to two big factors:

(1) Biggest one is the very heavy expenditures for expansion and modernization of facilities—which are now paying off in increased efficiency and lower production costs.

(2) The other factor is price increases which helped keep profit margins ahead of higher costs.

As steel business started improving in the fourth quarter, and production was increased, earnings began to respond: Fourth quarter 1954 income is 8 pct lower than the similar period of 1953.

Dividends Up

Judging by financial results of steel producers last year when operations slipped to an average of 71 pct of rated capacity, 1955 should be a very satisfactory year. Most estimates of production range from 80 to 85 pct of capacity. If the year turns out as good as expected, earnings reports a year from now will make pleasant reading for stockholders.

Stockholders of several companies, including U. S. Steel and Bethlehem, received good news from the financial reports issued last week — higher dividends on common stock.

Bethlehem's announced dividend of $2.25 per share on common is the highest amount yet to be paid on its present capitalization. U. S. Steel raised the dividend on its common stock to $1 a share from the previous 75¢. And Benjamin Fairless, chairman said he hoped the company would be able to continue paying that amount.

U. S. Steel also announced a 2 for 1 stock split which caught financial circles by surprise and caused steel stocks to take a good ride on the Big Board. Speculators were almost equally surprised 2 days later when Bethlehem failed to split its stock (it had been anticipated in some circles that Bethlehem would announce a 3 for 1 split). Eugene G. Grace, Bethlehem chairman, explained that directors of his firm saw no reason to consider a stock split now.

Despite lower operating rates in 1954, profit margins did not suffer. U. S. Steel's net earnings in 1954 were 6.0 pct of sales, compared with 5.8 pct in 1953. Bethlehem Steel's earnings in 1954 were 6.4 pct of sales, the same as in 1953.

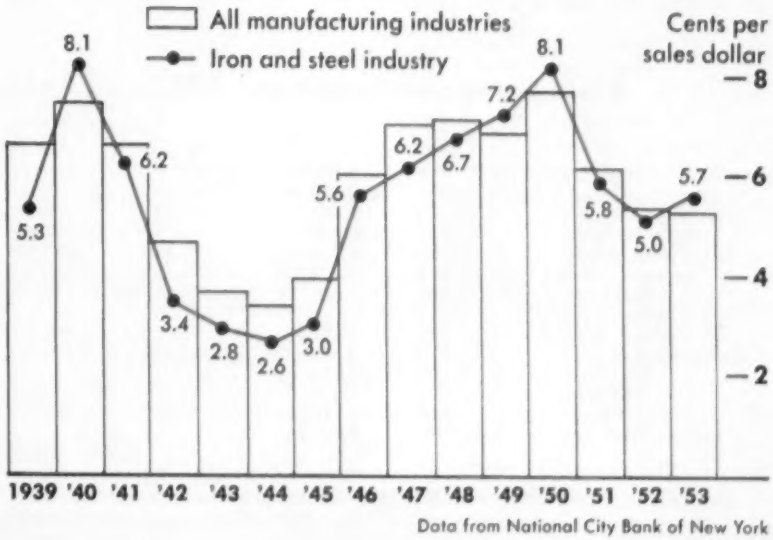
Bethlehem:

Plans $100 million Sparrows Point expansion . . . Finishing capacity to be boosted.

Bethlehem Steel Corp. will spend $100 million to expand steel finishing capacity by 1 million tons per year. This is in addition to previously announced expansion plans of the company, according to Eugene G. Grace, chairman.

Together with previously authorized expenditures for expansion this means that Bethlehem now has a $200 million backlog of

Net Earnings Per Dollar of Sales



Data from National City Bank of New York

facility improvements planned.

All of the newly announced expansion is to take place at the Sparrows Point, Md., plant. Main points of the expansion program include:

(1) Building of new sheared plate facilities; complete with auxiliary equipment including new descaling equipment, and facilities to shear plates to any size.

(2) New electric weld pipe mill will replace the present lapweld mills. New mill will produce pipe ranging from 4½ to 16 in. diam, at ½ in. wall thickness.

(3) A new 48-in. cold reducing mill for production of tinplate and cold-rolled sheet. This gives Bethlehem five full producing mills at Sparrows Point.

Working with the cold reducing mills will be a four-high tandem skin pass mill to prepare raw materials at that point.

(4) Bethlehem is adding two electrolytic tinplate lines complete with auxiliary equipment.

Also being added are two continuous annealing lines.

(5) In addition, Bethlehem will build two continuous galvanizing lines which will bring the total number to three.

Bethlehem's ambitious program, which is expected to be completed about mid-1956, will add one million tons of shipable finished steel products, Mr. Grace said. The planned expansion brings Bethlehem's total postwar investment in new facilities to $1 billion.

Semi-finished material to feed the new finishing mills will be available without addition of new ingot capacity. Mr. Grace said that non-integrated producers currently being supplied with semi-finished steel will still be able to depend on Bethlehem as a source of supply.

Red Trade:

East-West trade shows little increase despite many inquiries.

Soviet bloc countries are showing little interest in increasing trade with the U. S. despite relaxed export regulations instituted last summer.

Commerce Secretary Sinclair Weeks, in a preliminary appraisal of the effects of the Aug. 26 revisions in export controls, says there has been a "substantial increase" in hypothetical inquiries on the part of U. S. exporters, but no "significant" changes in the volume or type of export license applications for trade with Iron Curtain countries.

Mr. Weeks points out that there is a much higher rate of use of licenses for other countries than for Soviet bloc countries, indicating that, even after U. S. exporters receive firm orders from the Reds and obtain licenses, financial or other obstacles cause orders to be cancelled.

The department has had an increasing number of inquiries from exporters wanting to know what the policy would be if an export application for shipment of specified commodities to the Soviet bloc were filed. Commerce Dept. officials won't give firm answers, but in general answers that if the goods are on the positive list the license is "likely to be denied." If not, it "may be approved."

Although not on the positive list the license will be denied if:

(1) The goods are acquired from the Commodity Credit Corp. and will be exported for cash reimbursement at prices less than the U. S. government invested in them.

(2) The commodities will be exported in such large quantities as to endanger a "delicate balance between domestic supply and demand."

(3) The transactions "involve circumstances which would make approval inconsistent with the national interest."

The embargo on exports to Communist China and North Korea remain unchanged.

No Big Jump

The revisions in export regulations were designed to place U. S. exporters on more competitive basis with foreign exporters; to provide an opportunity for more trade in non-strategic goods; and to provide stricter and more effective enforcement by friendly countries over strategic goods being shipped to the Soviet bloc.

In the 60 days immediately following the revision, $585,000 worth of export licenses to Red countries were approved and $4.6 million worth were denied (including $4.4 million worth of cottonseed oil). Only three licenses were issued which would have been denied under the earlier regulations.

Total value of Soviet bloc export applications dropped from $4.4 million in the second quarter to $3.6 million in the third quarter of 1954. Approvals in the third quarter amounted to $1.3 million, compared with $3 million in the preceding quarter.

Actual shipments totaled $850,000 in the third quarter, bringing the total for the first 9 months of the year to $1.7 million.

Steel Company Earnings—1954 and 1953

Company	1954 12 Months	1953 12 Months	Fourth Quarter '54	Fourth Quarter '53
U. S. Steel	$195,236,672	$222,087,840	$57,061,698	$56,012,628
Bethlehem Steel	132,837,154	133,947,837	48,383,317	40,422,497
Republic Steel	52,875,164	56,743,547	.....	13,984,990
Jones & Laughlin	24,032,000	31,015,000	8,498,000	5,845,000
National Steel	30,334,871	49,174,080	11,135,153	13,256,014
Youngstown	20,182,500	30,839,716	6,637,803(b)	7,837,819
Armco Steel	.....	.....	.....	.....
Inland Steel	41,287,152	33,867,184	.....	9,817,867
Colorado Fuel & Iron	3,056,524*	4,864,505*	1,637,789	2,380,708
Wheeling	9,595,740	12,458,311	.....	.....
Sharon	.....	.....	.....	.....
Kaiser Steel	710,744(a)	5,417,919	.....	.....
Lukens Steel (c)	2,014,791	3,607,713	.....	.....

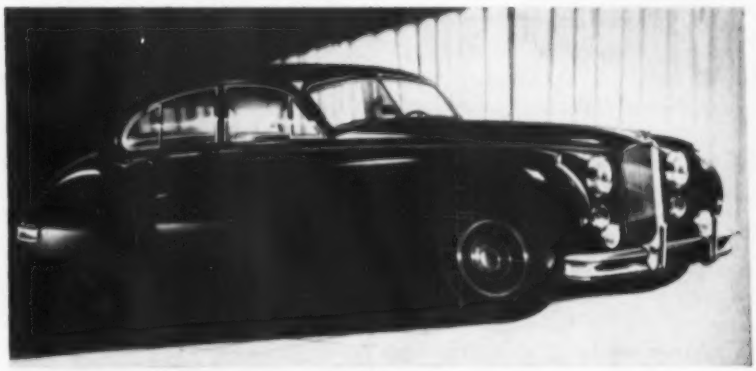
* = 6 mos.
(a) = Net loss, 6 mos.
(b) After giving effect to $588,000 tax credit.
(c) = Fiscal year ended Oct. 23.

BRITAIN: Auto Output Sets New High

Production of new vehicles tops one million mark in 1954 . . . Exports of automotive products establish all-time high . . . Industry leaders plan increased output and spending for coming 5-year period.

◆ AN ALL-TIME HIGH in production was reached by British automotive manufacturers in 1954 with more than one million vehicles rolling off assembly lines.

Production of cars and commercial vehicles totaled 1,038,834 during 1954—200,000 more than in 1953. Car output at 769,165, compared with a total of 595,000 in 1953, while production of commercial vehicles at 269,669 compared with 240,000 in the previous year. Cars alone have been rolling off assembly lines recently at the rate of one every 10 seconds of the working day.



EXPORT BOOSTER: Jaguar Mark VII M helps British auto manufacturers hit all-time high in overseas purchasing markets.

More Go Down Under

Export values of all British motor industry products reached a record level of about $952 million —$112 million more than in 1953 and $44.8 million greater than in 1952, which was previously the industry's best year.

Production was divided almost equally between the home and export markets. Car exports rose by nearly 64,000 to 366,000, while commercial vehicle manufacturers raised their exports by over 15,000 buses and trucks to more than 126,700 units. Domestic car sales increased by about 70,000 units over 1953 levels.

Sweden Big Buyer

Australia and New Zealand received more than two-thirds of the 64,000 increase in car exports owing to relaxed import controls. Increased purchases by these countries also contributed largely to the rise in commercial vehicle exports with South Africa, Eire and Portugal furnishing additional major markets.

Sweden topped the United Kingdom's European export market with nearly 40,000 units bought while Belgium, Denmark and Holland also took more cars than in 1953. Sales to the U. S. rose by about 1000, while car exports to Eire were almost 7000 units higher than in 1953.

Call It "Stepping Stone"

U. K. agricultural tractor manufacturers shipped abroad 110,500 units in 1954—15,000 more than in 1953. Outstanding increase was achieved in sales to the U. S. which mounted four times above 1953 figures reaching $9 million.

In evaluating the 1954 alltime production record, which more than doubles Britain's pre-war automotive output peak reached in 1937, British automotive manufacturers describe it as a stepping stone to increasing production and export goals.

Object of the current capital expenditure outlay which the industry has embarked upon is to raise automotive output to 1,500,000 units within five years. Present plans by Ford for example call for $182 million in development during the next 5 years. Vauxhall estimates an expenditure of $100 million over the same period while British Motor Corp. expects to be producing 12,500 vehicles a week by the summer of 1956. It is estimated at the same time that manufacturers' expansion plans will require capital investment by component and accessory makers of at least $280 million over the next few years.

New Brazilian Mill

Brazil will be getting a new steel mill which will be located near the port of Santos. Cost of the new facility is estimated at about $135 million and its capacity will be 210,000 tons annually. First production is planned in about 3 years, although financing arrangements have still not been firmed.

The new mill will be erected on a key point in the flat land near the coastal ranges where Cubatao Refinery and the Cubatao Hydroelectric plant, the largest in Brazil, are also located. A new canal will be dug to permit direct unloading of iron ore ships which will bring raw material from Minas Gerias via the port of Victoria.

The Iron Age INTERVIEWS:

Eugene M. Hinze

Tells How to Cut Foundry Costs

Main problem for most foundries is lack of proper costing and poor selling policy . . . Too many firms sell on a flat cost per lb basis . . . A checklist for your firm.

Q. What is the major failing of foundries today?

A. Their lack of proper costing, coupled with inadequate selling policy.

Q. In what way are their sales policies inadequate?

A. In a good number of foundry failures, sales policy is in a weakened condition because selling prices are based on competition or what the market will bear rather than on a true and accurate production cost.

Q. How can they determine true costs?

A. In the gray iron foundry industry we have established 20 cost and management groups throughout the country. On a quarterly basis, participating foundries confidentially compare unit costs in melting, molding, core, cleaning and shipping departments on exactly the same basis as competing or neighboring foundries. It enables participating companies to determine where their costs are out of line in comparison with other foundries.

Q. What is the most common mistake foundries make in figuring their costs?

A. Too many sell on a flat cost per pound basis rather than analyzing their own internal costs which would enable them to separate the most profitable jobs—the ones they are best equipped to handle.

Q. What's the easiest way for foundries to break down their costs?

A. Aside from participation in the cost and management groups the Gray Iron Foundries Society has recently published Cost Manual II. With this manual a foundry can very simply and accurately set up cost centers for each type or method of producing castings such as bench molds, squeezer molds, heavy crane floor molds, etc., enabling it to determine true costs within each cost center.

Q. Does this manual set up a radically new system of cost accounting?

A. There is nothing radical or basically new in the manual since a good number of progressive foundries have actually used these methods in one form or another for some 25 to 30 years. However, this is the only centralized source available for this information.

Q. How can a good accounting system help a foundry?

A. Well, for example, last week we did some cost consulting at one foundry and the cost manual and cost center method of accounting showed the foundry's squeeze department was very inefficient, primarily due to the lack of modern mold squeezer equipment. Under the firm's old method of accounting, these inefficiencies were buried and undetected.

Q. In a case like this can new equipment be justified without any major increase in present sales?

A. Very definitely. In this particular case, without the acquisition of new equipment in that cost center, the foundry's squeezer work was so inefficient that it just couldn't compete.

Q. Can systems such as this be used with the same personnel?

A. In most cases we find that with Cost Manual II we have easily been able to use the same cost or bookkeeping personnel.

Q. Do you find foundries generally willing to overhaul internal accounting methods?

A. Foundries which have had prolonged unpleasant financial experiences are naturally more prone to a change if they can see a way of bettering their position.

Q. Do you find the one-man foundry operator willing to go along with costing improvements?

A. Gradually the so-called "one-man" foundry operator is finding it necessary to keep his cost system abreast with production and technical improvements or go out of business.

Foundrymen: What Shape Is Your Firm In?

By checking your firm on these points you can tell whether a drastic change in policy is needed.

Eugene M. Hinze, Manager
Runge Foundry Costs Systems
E. T. Runge & Associates
Cleveland

GOOD	AVERAGE	POOR
POLICY		
☐ 1. Policies and objectives clearly defined and understood.	☐ 1. General policies not clearly defined nor understood.	☐ 1. No general policy except carry on tradition.
☐ 2. Aggressive participation in trade and business associations.	☐ 2. Interest in trade and business associations limited.	☐ 2. Trade and business associations a necessary evil.
INDUSTRIAL RELATIONS		
☐ 3. Program planned to minimize labor turnover, build morale and efficiency.	☐ 3. Industrial relations program not planned but ably run. Morale, efficiency average.	☐ 3. Little consideration of industrial relations—employee turnover high.
☐ 4. Effective selecting, testing, placing and training of all personnel.	☐ 4. Employee selection not developed beyond separate formulas for clerical, other help.	☐ 4. No uniform procedure for applicants. Interviewing by department head only.
PRODUCTION CONTROL		
☐ 5. Completely planned and scheduled in accordance with sales and manufacturing.	☐ 5. Planning is for principal items only. Material and labor needs determined by Dept. heads.	☐ 5. No central production control. Production dictated to keep men busy. Inventories uneven.
MANUFACTURING		
☐ 6. High-quality low-cost production obtained with modern machinery, good layout and material flow, high labor efficiency under able supervision.	☐ 6. Material flow needs improvement. Machinery up-to-date. Costs not low in field. Improved supervision needed.	☐ 6. Manufacturing not well planned or supervised. Machinery old, material flow poor, product quality fair.
QUALITY CONTROL		
☐ 7. Quality control is separate function. Efficient inspection tailored to each product and used as sales aid.	☐ 7. Quality control not centralized. Inspection performed as manufacturing necessity only, except for customer complaints.	☐ 7. No separate quality control function except when complaints force extra precautionary measures.
SALES—MERCHANDISING		
☐ 8. Sound pricing based on accurate costs, giving weight to all cost factors.	☐ 8. Price structure rigid. Accurate costs not used to set prices. Competition affects pricing.	☐ 8. Selling prices based on competition or what market will bear. Cost data seldom used.
☐ 9. Profit or loss determined by customers or jobs.	☐ 9. No attempt to analyze gross, net profit by customers or job.	☐ 9. No sales analyses.
COST ACCOUNTING		
☐ 10. All estimates for product pricing based on true and actual costs; loss of volume or profit indicated.	☐ 10. Estimates not checked against actual cost.	☐ 10. Estimates determined by past performance and competition only.
☐ 11. Accounting data supplied promptly, in a form best adapted to its use by management.	☐ 11. Accounting data not adequate in comparison with most modern conceptions of cost control.	☐ 11. Accounting not highly regarded as a tool of management.

Source: E. T. Runge & Associates

EQUIPMENT: What Road Program Means

Earth moving equipment sales perked up at year end . . . Stimulus was already-standing construction backlogs . . . Ike's 10-year highway plan would up equipment buying for first 2 years—*By K. W. Bennett.*

◆ SALES of earth moving equipment have been perking up since September. Last week, at Chicago, executives who build or sell the big cranes, bulldozers, and shovels were speaking confidently of a 30 pct overall advance in the industry's production rate over the decline of 1954. Many argued that the 30 pct figure was overly conservative.

Though the 10-year highway program, when ready, will more than double roadbuilding activity over the period, the current construction equipment upturn is solidly based on going orders based on building programs already begun. Part of the climb represents deferred consumer spending; part of it a new building program that is showing no sign of faltering after a record high in 1954.

The Clay Committee program calls for an additional $50 billion to be spent on road and highway construction for a 10-year period, assuming that about $47 billion will be spent during the same period anyway. Of the additional $50 billion, the Federal Government would contribute $25 billion.

Task Forces One and Two of the American Road Builders Assn. had spelled out the effect of such increased spending by mid-January of this year. A $97 billion highway program stretched over 10 years would mean an additional 1,019,000 tons of steel purchased for highway building in 1955; an additional 2,039,000 tons in 1956, and an additional 3,568,000 tons in 1958. This in addition to the 1,632,000 tons calculated by Chairman A. T. Goldbeck's Task Force Two as a normal requirement.

To Task Force One, headed by F. W. Salditt of Harnischfeger, the 10 year program would mean a climbing volume of equipment sales for the first 2 years of the program, and gradual decline followed by a second and slightly lower peak in the second 5-year portion of the decade. The total replacement and additional units required in the first year of such a program would total 126,307.

What Roads Cost in '54

Current upturn in construction equipment is based on something that is already here. Builders speak of unseasonally high December and January sales. Part of the answer is backlogged demand from consumers being transformed into backlogs of orders.

It's been estimated that in highway spending alone, the 1954 construction and repair outlay reached $6.4 billion and that $3.7 billion of this was new construction. Toll road outlays in 1955 are expected to advance by another 25 pct. The 1954 figure was an all time high, as was the case in other construction fields.

Nonetheless, construction equipment sales declined by an estimated 35 pct for the industry. With construction continuing at unusually high rates through the normally slack December-January season, the contractor who deferred his purchases can no longer afford to wait. He needs the equipment for jobs he already has placed on his own books.

Best Season Yet

Like the majority of industry, construction equipment producers were living on raw material inventories through first half 1954, but steel men were beginning to report an increased tonnage of plate, sheet, structurals, and rounds to equipment builders as early as September.

How Much They Sold

Value of shipments of earth moving equipment except power cranes, drag lines and shovels.

YEAR	TOTAL	MONTHLY AVERAGE
1947	$432,408,000	$36,034,000
1948	513,356,000	42,779,000
1949	440,159,000	36,679,000
1950	453,140,000	37,761,000
1951	584,278,000	48,689,000
1952	623,261,000	51,938,000
1953	612,013,000	51,001,000
1954	406,000,000*	45,100,000*

*Nine month total

Source: Dept. of Commerce

HEAT TREAT: Future Looks Bright

Builders of furnaces, induction units, see good year ahead . . . Auto engineer points up mechanization trend, use of furnaces in machining lines . . . Huge expansion ahead, Westinghouse official says.

◆ BUILDERS of most of America's heat treating furnaces and induction heating equipment have just taken a good look at their future and are pretty cheerful about what they see. Meeting last week in Detroit, members of the Industrial Heating Equipment Assn. heard a forecast of a huge expansion in metalworking during the next 10 years. And one of their customers outlined technical trends of this equipment in the automotive industry.

Immediate prospects look good too. "We're just as optimistic today about business for the coming year as we were pessimistic a year ago," said the association's new president, Horace Drever, Philadelphia.

The growing tendency to put heat treating equipment in machining lines poses new problems for furnace builders, according to Robert Morken, Chrysler Corp. heat treating specialist. Mr. Morken told the group that these included steps to reduce downtime, improve safety, increase mechanization and reduce distortion in treated parts.

Simplification of mechanical functions, use of convenient access doors, accessibility for inspection and improved refractories were among the steps he suggested to cut downtime of furnaces in machining lines. Refractories are the No. 1 replacement problem, he noted, and with temperatures rising every year they will need even more attention. Temperatures to 500°F may be the pattern for the future. Even today, much equipment is being operated at 2000° to 2600°F. Wider use of standard refractory shapes to ease the inventory problem was another suggestion. Safety and insulation factors are also receiving more attention from builders because of in-line furnace locations.

"We can no longer think of distortion in heat treating as inevitable," Mr. Morken declared. Pointing out that quenching fixtures merely control distortion he noted that some progress has been made through martempering and austempering.

Induction and flame hardening are ideal for use in machining lines he said; in some cases induction or flame hardening equipment is built into machine tools. Because much of the parts they process are cold induction and flame hardening units lend themselves particularly to automation.

View Long Term

Another trend the speaker predicted would continue is that toward lower alloy or plain carbon steels, with selective hardening to secure needed properties. He also commented upon the trend to shallower case depths, predicted wider use of automatic carbon control. Future furnaces will heat faster and forging furnaces might well be equipped with automatic unloaders to avoid burring billets in case the line stops.

The long range look was provided by K. M. Patterson, industrial sales manager, Westinghouse Electric Corp., East Pittsburgh. He gave an unusual presentation, using three synchronized semi-automatic slide projectors and a wide-screen.

The metalworking industry's equipment purchases increased from $3 billion in 1942 to over $5 billion in 1954, he said.

K. M. PATTERSON

Estimated Increase in Power Demand

Kilowatt Hours, 1953-1958

Here's a look ahead at probable expansion in several segments of metalworking, according to K. M. Patterson, industrial sales manager, Westinghouse Electric Corp., in his IHEA talk:

Electric furnaces for heat treating, annealing	3,200,000,000
Induction heating	650,000,000
Steel	11,200,000,000*
Aluminum	3,000,000,000
Titanium	560,000,000

*Includes some of gain shown in first two categories

Also boosting metalworking power needs: Faster cutting speeds; automatic and tracer controls.

EXPANSION

TITANIUM: Expect Huge U.S. Expansion

Present 35,000-ton sponge goal may be upped to 50,000 or 70,000 tons . . . Will probably boost stockpiling . . . Aim higher on scrap reuse, mill facilities . . . Must top technical hurdles—*By N. R. Regeimbal.*

◆ GOVERNMENT actions to expand titanium production and mill facilities will be stepped up in 1955 "considerably" above what is called for under present expansion goals.

Initial action raising the present expansion goals of 35,000 tons a year of sponge and 37,500 tons a year of mill products is expected soon by the Office of Defense Mobilization. In addition, ODM will direct the General Services Administration to step up its negotiations and contract letting to get more firms into the titanium industry, reliable sources indicate.

Late last fall, Defense Dept. and Commerce Dept. turned over to ODM the first official estimates of what the military and civilian requirements for titanium would be in case of an all-out war.

While the exact figures are closely guarded secrets, an ODM official testifying before a congressional committee recently said that requirements are "very much" above present goals. Sen. George W. Malone (R., Nev.) former chairman of the Senate Materials Preparedness subcommittee, has been pressing for a 150,000-ton-a-year industry.

Won't Top 100,000 Tons

However, the new goals, although substantially above present ones, are not expected to go over 100,000 tons, and will probably be closer to 70,000, or even as low as 50,000 tons.

The recommendations for the mobilization needs, it is understood, are based on capacity to deliver titanium mill products to fabricators, and involve fairly high scrap recovery.

Another phase of the titanium expansion will probably involve a stepped-up stockpile program. As part of its contracts with producers, the government agrees to buy all titanium produced, retaining about 90 pct for defense work and permitting the remainder to go for civilian uses. As a result, there is a surplus of less than 2000 tons at any one time and little, if any, titanium has been purchased for the stockpile. One report is that a $1.4 billion titanium stockpile is being considered.

What GSA Plans Now

Facilities now operating or under construction have a capacity of 22,500 tons a year. Figures released by Sen. Malone show that titanium metals plant at Henderson, Nev., has a capacity of 3600 tons a year; du Pont's Wilmington, Del., plant turns out 3600 tons a year; the Cramet plant at Chattanooga, Tenn., will produce 6000 tons a year when completed later this year; the Dow Chemical Co., Midland, Mich., facilities will produce 1800 tons a year by mid-'56; and the Union Carbide and Carbon Co.'s plant at Ashtablua, O., will produce 7500 tons a year sometime in 1957.

GSA is now concluding negotiations for additional plants and expansion of existing facilities which, if consummated, will add another 18,200 tons a year to capacities—3200 tons more than the present goals call for. Included are a new plant to be built by du Pont near Johnsonville, Tenn., to produce 7200 tons a year; a 5400 increase in capacity at Titanium Metals, Inc., plant at Henderson; a new 4000-ton-a-year plant in Southern California, and a 1000-ton-a-year plant near Boulder City, Nev.

A 70,000-ton titanium sponge goal, plus re-use of about 30,000 tons of scrap—almost all that would be generated on the mill and fabricating level—would mean a 100,000 ton potential.

Mill Capacity Lags

Scrap use, however, still presents considerable technical and handling problems that must be solved before extensive remelting is possible (See THE IRON AGE, Dec. 23, 1954, p. 19).

Mill capacity is even less advanced than sponge production, so that much of the government's new titanium push will be toward solving mill problems, including adapting stainless steel facilities and increasing production of Grade A sponge with a low hardness.

Still another problem besetting the titanium industry that cannot be solved by government edict is the difficulty of producing consistently high quality ingots from the sponge. Industry sources indicate that sponge quality is at least okay—as long as it hasn't been sitting around too long. It is felt by some technical experts that moisture picked up by the sponge in

"You've got to hand it to him, he sure is handy."

inventory or transit is one of the top factors contributing to inconsistent ingot quality.

There is some feeling that the government stockpile of sponge may be largely worthless as a result of this.

One recently proposed answer to the problem would be integration of sponge and ingot making facilities so that the sponge could be melted immediately. This would eliminate or reduce the hydrogen embrittlement by preventing moisture from attacking the sponge.

ODM is also negotiating financial arrangements for expanding by 6000 tons a year the scrap melting capacity of the industry.

Several aircraft industry representatives, testifying before Sen. Malone's subcommittee, say they have advanced design planes "on the drawing boards now," awaiting a sufficient titanium supply before production can be started. Testimony at the hearings, soon to be released to the public, will highlight the increasing stress titanium will get in the mobilization picture.

Predicts Strong '55

Metalworking activity in 1955 will approach the peak levels of 1953 and will probably exceed them in 1956. Steel ingot production will top 100 million tons this year and in all probability will reach 106 million tons, compared with output of 88.3 million tons in 1954 and 111.5 million tons in 1953. The odds are against a steel strike this year but a moderate wage increase (8¢-10¢ per hour) and steel price increase of $3-$5 per ton seem likely.

This optimistic forecast was made by IRON AGE Editor Tom Campbell at a meeting of the Advertisers Assn. of Columbus and the Columbus Advertising Club in Columbus, last week. Mr. Campbell also predicted substantial improvement in machine tool and machinery business this year and looks for stronger railroad buying.

Mr. Campbell said the basic business improvement will be enlivened even more next year because of the elections—the Republicans like being in office and will do everything they can to stay in.

FIRST TURBOPROP transport delivered to Military Air Transport Service is this Convair YC-131C powered by a pair of Allison YT-56 gas turbines rated in the 3000-hp class. MATS will conduct tests on this and five more turboprop-powered transports. All are modified from standard models.

Planes:

Navy delays full production until testing complete.

Airplanes delivered to the Navy from now on are to be virtually combat-ready, requiring no major alterations. The new plan worked out by the Navy is designed to give the manufacturer enough time to test his planes thoroughly and remove the kinks before delivery. In the first 3 years after a plane is built, production is to be held at a low rate and all assembly-line models will go into the test program.

Fleet delivery will be postponed until all the test work on a new model is nearly complete and undesirable features have been corrected. This represents a switch from the World War II idea of speeding the production buildup as soon as possible after a prototype passed its early trials. Too often, says the Navy, the result was a pool of aircraft awaiting extensive modifications which combat experience had shown were needed.

Use More Test Planes

Now the airframe manufacturer is being given greater responsibility for integrating related components, which may be supplied by industry or the government, into a coordinated system. This change is seen as especially applicable to armament fire control, combining radar, instrumentation, and flight controls.

A larger number of test aircraft will be used to complete the necessary testing in a shorter time. This will eliminate the need for taking planes off flight status.

Official Navy belief is that the new plan, besides being technically sounder, gives the Navy a better chance to make a complete evaluation of a new product before actually committing large amounts of production funds. It also offers the contractor a more dependable goal for his planning.

Contracts Reported

Including description, quantity, dollar values, contractor and address. Italics indicate small business representatives.

3"/50 AA projectiles MK 33 mod. 0., 130000, $682,500, Lansdowne Steel & Iron Co., Morton, Pa.

Deck edge airplane elevator machinery, 4 ea, $2,136,412, Otis Elevator Co., New York 1, N. Y.

Tractors, warehouse, gasoline, 386, $899,932, est., Clark Equipment Co., Battle Creek, Mich.

Rifles, recoilless 106 MM, M40 (T170E1) mounts, M79 for rifle, recoilless, 2748, $2,961,587, The Oliver Corp., A. B. Farquhar Div., York, Pa.

Turret systems, 65, $18,691,124, Westinghouse Electric Corp., Baltimore, Md., *L. W. Willey.*

Helicopters, 72, $2,271,600, Hiller Helicopter Corp., Palo Alto, Calif., *E. A. Grindle.*

SHEET: Newport Opens New Cold Mill

Kentucky mill starts new facility at top of tight cold-rolled sheet market . . . Firm aims at diversification . . . Delivery already in 4 to 6 week range, see further extension—By *T. M. Rohan.*

◆ NEWPORT STEEL CO. couldn't have timed the opening of its new cold-rolled sheet mill any better with a crystal ball.

At the height of the tightest market in months in a heavy consuming area the 120,000-ton-per-year mill across the Ohio River from Cincinnati was started up last week by Kentucky's Acting Gov. Emerson Beauchamp. Already the mill is offering 4 to 6 week delivery of 48 in. wide strip and has made several emergency shipments to hardput customers.

Aim At Diversification

At the opening ceremonies, Louis E. Wolfson, president and board chairman of Newport and the parent Merritt-Chapman & Scott Corp., said:

"When acquiring Newport Steel last March, we said it was our intention to work for an acceleration of activity here; to seek greater diversification in the mill's end products, and to make its output available to our customers.

"The opening today of this new cold-rolling mill reflects some of the appreciable progress we have achieved to date in our program to expand and modernize Newport's facilities. While a major item, it is but one of a number of improvements added during this past year, all of them designed to place Newport in position to serve its customers to greater advantage.

"This is an opportune occasion to re-emphasize that we consider our customers as integral members of Newport Steel's business, always with first claim upon production. Merritt, Chapman & Scott requires very little of Newport's output for its construction and other activities. Our interest, rather is in furthering a long term growth for Newport Steel solidly founded on customer satisfaction. We intend always to follow a strict policy of first obligation to established customers."

R. E. Harvey, executive vice-president and general manager and newly elected member of the Merritt, Chapman board, told THE IRON AGE the mill is currently quoting 4 to 6 week delivery and expects it to lengthen to 8 weeks in a month. One emergency order for 1000 tons is now being rolled and other smaller orders for immediate delivery are being handled from inventory accumulated during test runs since December. Many consumers in Cincinnati, Dayton, Hamilton and other nearby centers send their own trucks to take delivery at the mill.

Major markets for the sheet are auto stamping plants, appliance manufacturers and farm implement firms in southern Ohio, northern Kentucky and southern Indiana. This is probably one of the largest and hottest cold-rolled sheet markets outside the Detroit and Chicago areas. Plants in this area include Fisher Body at Hamilton, O., Delco-Remy Div. and Frigidaire at Dayton, Westinghouse at Columbus and GE Appliance Park at Louisville.

Fabricated Structural Steel

Contracts, Shipments, Backlog for December, 1954

	1954	1953	Estimated Net Tons Avg. 1947-50
CONTRACTS CLOSED			
December	196,767	204,227	207,912
Year to Date	2,509,817	2,786,591	2,370,040
SHIPMENTS			
December	223,533	266,926	199,379
Year to Date	3,135,525	3,117,711	2,256,536
BACKLOG	1,280,882	1,740,998	1,423,620

Source: American Institute of Steel Construction

Health:

Study shows more companies act to keep top men fit.

Health programs calling for periodic examination of executives are a coming thing, says National Industrial Conference Board on the basis of a recent study. Of 120 company programs checked, over half had been initiated in the last 10 years. New concern for health of executives is attributed to realization by companies of their stake in keeping key men alive and fit.

Most executives have gone along with the programs, which place examinations on a voluntary basis, but the need for a strong selling job is stressed. Personal letters from the president followed by periodic reminders are included in most going programs.

In foreground, loading heap sand for transportation to magnetic conditioner. In background, delivering facing sand to molder.

Dumping heap sand into hopper of magnetic conditioner. The fast-loading, fast-traveling, fast-discharging Auto-Scoop moves more loads per hour, speeds production.

A load of facing sand on its way to a molder. Runway is defined by banks of molds. Compact design of the Jaeger Auto-Scoop simplifies work in narrow aisles, cramped quarters.

Unloading facing sand into hopper at molding machine. Simple controls and full visibility enable operator to spot load accurately, dump fast or slow, discharge partial loads.

Jaeger Auto-Scoops cut handling costs in Darling foundry

. . move more materials, faster, than loaders previously used

Replacing other loaders of less advanced design, Auto-Scoops handle more materials, with less effort, and get around in the plant more easily, reports Darling Valve & Mfg. Co., Williamsport, Pa. They're worked 18 hours a day on all kinds of sand handling, and also bagged materials, castings, etc. Operators also say they like the Auto-Scoops much better than any loaders previously used.

Superior performance is achieved because the Jaeger Auto-Scoop is specially engineered for most efficient scoop loader operation. It moves up to 25% faster, turns in only 6'6" radius with bucket in carry position, dumps over edges to 6'8" high, reaches to 2'7" and easily handles loads to 1200 lbs.—all greater than comparable loaders. Lower bucket tilt-back and lower carry insure a full bucket, improved stability, faster travel and eliminate excessive traction crowding. Boom arms and bucket are under hydraulic control.

These are only a few of its features that contribute to overall gains in production. For more data and specifications, write for Catalog L12-4 and name of the Jaeger distributor nearest you.

Besides bulk handling, Auto-Scoops come in handy for handling bagged materials, drums, etc. Big lifting capacity and large bucket facilitate maximum loads.

The Auto-Scoops are also used for transporting flasks and castings. An unusual additional application is to hoist maintenance workers to overhead lighting fixtures.

For bigger work, Jaeger offers the 1 cu. yd. Load-Plus, with torque converter, power steering and either front-wheel or 4-wheel drive.

The Jaeger Machine Company, 610 Dublin Avenue, Columbus 16, Ohio

JAEGER LOAD-PLUS auto-scoop

AIR COMPRESSORS • PUMPS • MIXERS • PAVING MACHINES

Distributors throughout U. S. and Canada and Principal Cities of the World

Grind Costs to a Minimum!

with BLANCHARD SURFACE GRINDERS

W-1102

Blanchard surface grinders are noted for their ability to save time and labor in machining flat surfaces. For example, a No. 18 Blanchard machines the steel blocks shown above at the rate of 4 cubic inches per minute . . . and produces finished tolerances for flatness, parallelism and dimension of .001" to .002"!

W-815

By dressing the chuck and using the correct wheel, the same Blanchard will finish grind pump parts to a flatness of .0002" . . . with surface finish of 4 to 6 micro-inches . . . at a rate of 40 pieces (80 surfaces) per hour!

W-802

Blanchard ground to make *tight* joints! These valve plates are used in refrigerator compressors.

No. 18 Blanchard Surface Grinder

Obsolete machining methods often result in high costs and low profits. If you are not getting maximum production, consider using Blanchard surface grinders. They're economical, extremely accurate and highly productive on a wide variety of jobs. And they enable you to make a decent profit at competitive prices.

Send for free copies of "Work Done on the Blanchard", (fourth edition), and "The Art of Blanchard Surface Grinding".

PUT IT ON THE BLANCHARD

THE BLANCHARD MACHINE COMPANY

64 STATE ST., CAMBRIDGE 39, MASS., U.S.A.

bright strong easy to form

for everything AND the kitchen sink

SINK RIMS are an excellent example of Superior Stainless in service—all the way from initial ease of fabrication, through simplicity of installation, to life-long durability on the job. Rims of Superior Stainless stay bright with a wipe—can't rust, peel or chip—add value to the entire kitchen unit! • Let's help you find *your* profit-application for Superior Stainless Strip Steel. Write us about your product, today.

Superior *Type* 430 **Stainless** STRIP STEEL

Superior Steel
CORPORATION
CARNEGIE, PENNSYLVANIA

HOW TO USE STANDARD HALLOWELL BENCHES AND ACCESSORIES IN PLANT MODERNIZATION

MODEL 606 – STEEL TOP. COMPLETE WITH STRINGER, LOWER SHELF, BACKBOARD, END PIECES.

ADD TOP SHELF

ADD SINGLE DRAWER

USE THEM AS INDIVIDUAL BENCHES

ASSEMBLE THEM IN CONTINUOUS LINE

4 TOP MATERIALS, 4 LENGTHS, 5 WIDTHS
3 LEG HEIGHTS – ALL STANDARD

ADD DRAWER TIERS

Standard Units · Standard Accessories · Sturdy Steel Construction · Stocked by Leading Shop Equipment Dealers · Send for "Benchery" – a Humorous Booklet on What You Can Do with Hallowell Benches · Hallowell Shop Equipment Division, Standard Pressed Steel Co., Jenkintown 17, Pa.

HALLOWELL SHOP EQUIPMENT DIVISION

SPS

JENKINTOWN PENNSYLVANIA

BENCHES (CABINET, WORK, UNIT) • STOOLS AND CHAIRS • SHOP DESKS • TOOL STANDS AND CABINETS • DRAWERS, DRAWER TIERS • STEEL CARTS • SHELVING

Report To Management

They Don't Agree With Ike

It's the kind of thing that makes horse races—but it's apparent that not everyone goes along with the President in his optimistic view of '55 business as expressed in his recent Economic Report.

In hearings before the joint Congressional Committee on the Economic Report, eight economists, most of whom belong to the "full employment" school, expressed both reserve and real concern over the business outlook. All agreed that total production would be up slightly from last year but not by enough to cut unemployment below '54 levels. Five of the eight actually expect there will be an increase in the number of jobless.

Most pessimistic of the economists was Leon Keyserling, chairman of the Council of Economic Advisers under President Truman, who declared that a 6 pct increase in the gross national product (this would up GNP to about $378 billion) was a must to "restore" maximum employment and production by the end of this year. This he doesn't believe is going to happen:

"If the American economy in 1955 averages a 3 pct higher level of output than in 1954, which is in accord with optimistic forecasts, this would not be nearly enough growth to reduce unemployment sufficiently, absorb new entries into the labor force and keep up with advancing technology." This he said would mean a considerable increase in unemployment over 1954 levels.

Mr. Keyserling also stated that unemployment is really worse than government figures show. He said the "true level of unemployment" is around 4 million (Census Bureau's estimate for '54 is 3.23 million) and that it might average as much as 6.5 million in 1955.

Purchasing Agents Play It Cozy

Also tending to counterbalance the aura of confidence that has been spreading across the country since the business upturn started in September is the latest report from the National Assn. of Purchasing Agents. Overall the purchasing agents are reservedly optimistic—they still expect 1955 will be a good year, but they have become cautious in their buying policy with the highest number in many months operating in the hand-to-mouth 60-day range.

Steel buyers give some signs of apprehension over what's going to happen when the steel industry and the United Steelworkers tangle early this summer, but few are at present planning to increase their inventories substantially in order to cover possible strike periods.

Purchasing agents say production is continuing at a high level, with 42 pct reporting an increase in January and 47 pct reporting no change from the previous month. However, new orders have tailed off slightly, with the number indicating increases the smallest since last August. On the other hand, the number reporting a decline in new orders is less than last month, and almost half have said there was no change.

Automakers Had Third Best Year

Final tally on factory auto sales for 1954 breaks down this way: Total sales amounted to 6,600,834 vehicles, including 5,558,739 passenger cars and 1,038,046 trucks and 4039 coaches. This made last year the third best in the industry's history.

Compared with 1953, total auto factory sales were off about 10 pct from 1953's 7,323,214. Sales of passenger cars dipped 8 pct from the previous year's 6.1 million while trucks declined a substantial 17 pct from the 1953 level of 1.2 million.

Highpoint in 1954 auto production came in December when automakers turned out 669,778 cars, 96,234 trucks and buses. This was the third highest monthly production total in history.

INDUSTRIAL BRIEFS

Awarded Contract . . . Allis-Chalmers Mfg. Co. has been awarded a contract by the Power Authority of the State of New York for eight hydraulic turbines for the St. Lawrence Power Project.

Product Directory . . . The Refractories Institute, Pittsburgh, has published a Product Directory of the refractories industry in the U. S. This volume lists over 2000 brand names produced by 159 refractory manufacturers.

Trade Fair . . . The British Industries Fair is scheduled for London and Birmingham, England, from May 2 to 13.

Summer Sessions . . . The University of Florida, North Carolina State College, Virginia Polytechnic Institute and Southern Regional Education Board are jointly sponsoring a series of cooperative summer sessions in statistics. The session will be held at the University of Florida from June 20 to July 29.

Established . . . The Garrett Corp., Los Angeles, has established a new Military Relations Dept. W. J. Pattison has been named director of military relations and foreign operations.

Expanding . . . Clark Equipt. Co. will expand its new Michigan construction equipment plant at Benton Harbor by 40 pct. The Austin Co. has been awarded the contract for the 60,000 sq ft expansion on the recently completed plant.

Open House . . . Jones & Laughlin Steel Corp. held an open house last week on Jan. 25 marking the official opening of its new Warehouse and Container Div. plant in Lancaster, Pa.

"Man of the Year" . . . David P. Reynolds, Reynolds Metals Co.'s vice-president in charge of sales, has been named "Man of the Year" in the light metals industry.

Office Moved . . . Worthington Corp. moved its Detroit district office from 2824 E. Grand Blvd. to 13305 Puritan Ave.

Dividend . . . The M. A. Hanna Co., Cleveland, declared a dividend of 50¢ a share on common stock, payable Mar. 14 to stockholders of record at the close of business Mar. 4.

In Operation . . . Alan Wood Steel Co., Conshohocken, Pa., has started operation of its new cold rolled strip mill at Ivy Rock, Pa.

Purchased . . . Aluminum Co. of America purchased an Atlanta, Ga., lot on which the company will build a new district sales office building.

Quarter Century Club . . . Pangborn Corp., Hagerstown, Md., welcomed 18 new members to its Quarter Century Club at the fourth annual banquet held recently.

Receives Order . . . Lewis Machinery Div., Blaw-Knox Co. received an order from Cochran Foil Co., Louisville, for three 62-in. wide aluminum foil mills.

Office Opened . . . Beryllium Corp., Reading, opened a sales office at 1915 S. Shepard, Houston, Tex. Ross E. Schofield is district representative in charge.

Acquired . . . Federal Machine & Tool Co., Inc., Long Island City, N. Y., has acquired Atlantic Carbide Co. and Colonial Tool & Cutter Co., both of Rochelle Park, N. J.

New Prexy . . . Society of Automotive Engineers elected Carl G. Rosen as its president for 1955. Mr. Rosen is consulting engineer to the president of Caterpillar Tractor Co.

They've Moved . . . Binks Mfg. Co.'s Seattle, Wash., branch has moved to 514 Denny Way. The new, enlarged office is managed by J. C. Level.

Exclusive Basis . . . Vulcan Crucible Steel Co. has appointed Steel Specialties, Inc., 5000 E. Monument St., Baltimore, as an exclusive sales agent for Vulcan tool steels in the Baltimore sales district.

To our Favorite Boss!

From the receptionist at the front door through to the last man on the loading platform—*all* of us here at Great Lakes Steel have a very important *something* in common. It is the knowledge that your continued and expanded need for our products determines the future and growth of every one of us, regardless of our individual jobs here.

It is the knowledge that *you*, Mr. Customer, are the boss!

That's why we at Great Lakes are seeing to it that our steel is the kind you have a right to expect from a specialist in flat-rolled products. We know the importance of prompt shipments, top quality, proper packaging and loading, dependable information, and clerical accuracy. We think you'll agree that our many satisfied customers are a pretty good indication that this policy is good business for all concerned.

Next time you have a problem in steel, call on one of our representatives to help you solve it. You'll be glad you did!

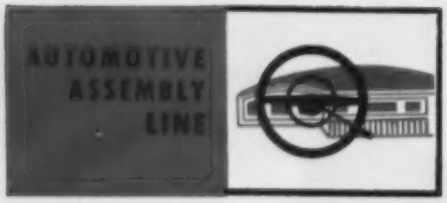
Great Lakes Steel

Ecorse, Detroit 29, Michigan

UNIT OF NATIONAL STEEL CORPORATION

PRODUCERS OF H A X HIGH-TENSILE STEEL HAX

SALES OFFICES IN BOSTON, CHICAGO, CINCINNATI, CLEVELAND, HOUSTON, INDIANAPOLIS, LANSING, LOS ANGELES, NEW YORK, PHILADELPHIA, PITTSBURGH, ROCHESTER, ST. LOUIS, SAN FRANCISCO AND TORONTO



Few Body Changes Planned For 1956

Large parts diemakers go from feast to famine . . . Automakers will make only minor alterations in basic '55 bodies . . . Business is booming for small parts producers who implement facelifting—*By R. D. Raddant.*

◆ DETROIT'S automotive diemakers, the first to know and the first to feel it, are agreed that there will be few major model changes for 1956 although faceliftings will be more significant.

"We're just sitting around hoping to pick up a job here and there," declared one of Detroit's leading automotive diemakers last week.

A year ago this same person was lamenting that he couldn't see how he could complete his fat program for one of the Big Three within a month of the time requested by the order placer. At that time this particular automaker was in the midst of its biggest model changes in history.

Get News Early . . . This response is typical of the reactions of Detroit's manufacturers of auto dies, the first suppliers to get the word of forthcoming model changes. What it means is that there will be few outstanding revisions of 1956 stylings.

On the other hand, the opposite reaction came from makers of small dies for trim, grilles, and small panels that are characteristic of faceliftings.

"General Motors and Ford are really spending the money," cheerfully responded a leader in this field. "Within the past two weeks we have quoted figures on over $1 million of work."

Revise Body Parts . . . Some makers of heavy dies have been asked to estimate hours of availability starting in April. They have been led to believe that General Motors divisions will have some heavy work in hood, grille, and rear panel revisions coming up. Chrysler divisions are also said to be working on rear end revisions throughout their entire lines.

Probably only Lincoln among Ford's present operating divisions will have a new body. This die work has already been or is in the process of being placed. The new luxury Continental die work is also out, according to diemakers.

Lincoln Will Change . . . Actually, a study of orders placed with diemakers confirms a logical assumption—that only Lincoln is due for an entirely new body, although faceliftings will have to be of significant scope to hold any automaker's market penetration.

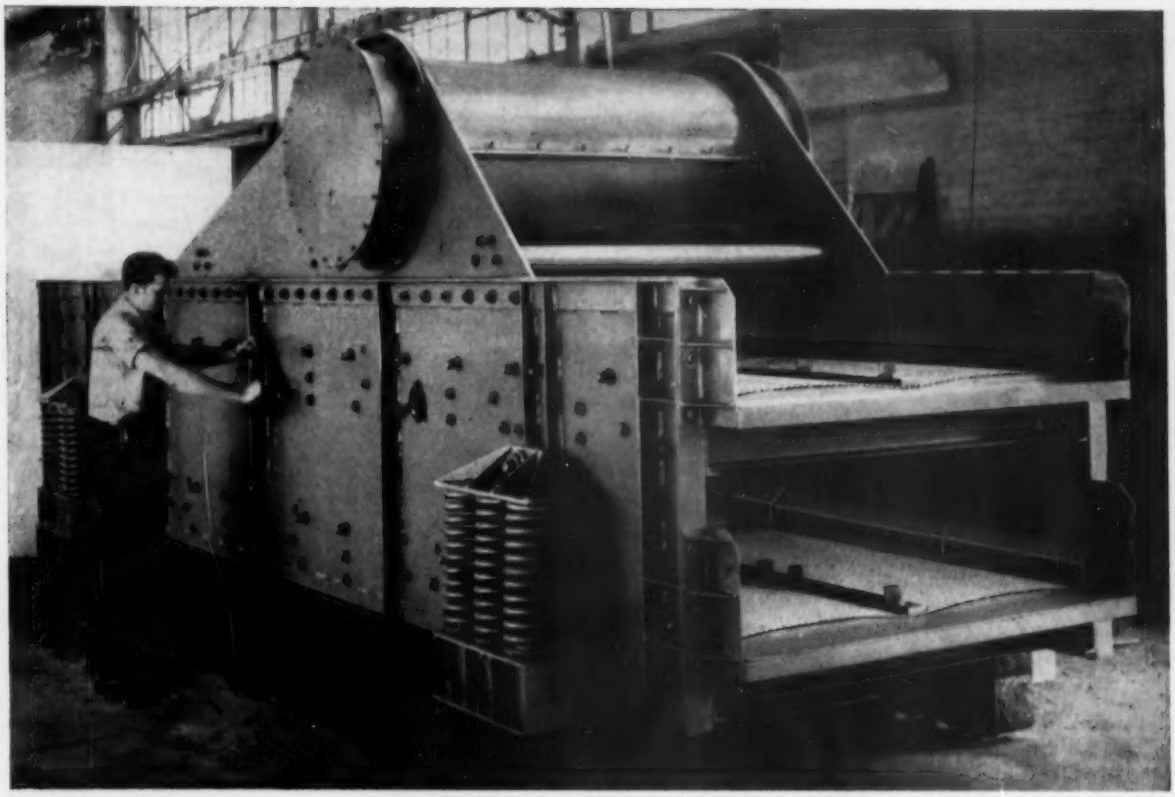
All Chrysler divisions had completely new bodies for 1955, as did Ford, Mercury, Chevrolet, Pontiac, Packard, Nash and Hudson. Speculation hinged only around GM's Buick, Cadillac and Oldsmobile divisions which had new bodies for 1954 and facelifting for 1955. But there is little chance now of basic body changes for these makes, if there ever was any serious speculation that a basic body would last less than three years while it is still selling.

Will Bow Early . . . The question about April availability for heavy die work indicates that new 1956 models will appear about the same time as did the 1955's, except that those who paid the price of tardiness this year will take every step to advance introduction dates to mid-autumn. It takes from 5 to 6 months to complete a heavy die program, although the amount of open space in dieshops should result in somewhat less than average time with extra availability of working space and personnel.

This absence of massive new tooling programs and defense work has resulted in considerable hardship for Detroit's usually thriving tool and die business. It has been estimated that of Detroit's 8000 diemakers, 3000 are now out of work.

Truckers Show Gain . . . Interstate Commerce Commission figures show truckers had revenues of more than $4.8 billion in the year ending last June 30, for an increase of 8.8 pct over returns in the previous year. These revenues represented 28 pct of the total intake of $17 billion reported to ICC by eight groups of carriers.

Turn Page



ASSEMBLING an RB&W high-strength bolt on Hewitt-Robins' new Eliptex vibrating machine.

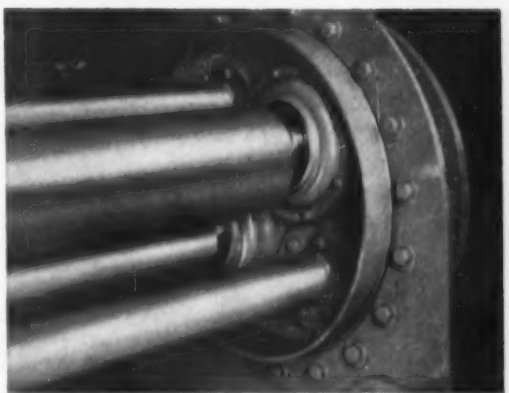
Standardizing on high-strength bolts saves Hewitt-Robins 25%—improves product!

Take a hard look at your fastening operations and you may find you will save a lot by using standard high-strength bolts instead of expensive specials.

Using a standard RB&W high-strength bolt plus a heavy semi-finished nut with two hardened washers, Hewitt-Robins is getting these advantages and savings on vibrating machines: 1. Saving 25% in yearly fastener cost. 2. Eliminating situations requiring body-bound connections with attendant reaming operations. 3. Eliminating all special, finished bolts with varied thread lengths and also all special lock nuts. 4. Eliminating procurement problems and slow delivery of specials. 5. Reducing nut and bolt inventory. 6. Obtaining better performance and lower maintenance on units.

The RB&W product has 2½ to 3 times the clamping force of the previous fasteners. Thus the assembled connection is better able to withstand severe vibration.

Maybe your operation doesn't give fasteners as hard a time as vibrating equipment, but it pays to look into the savings you can expect from specifying standards instead of specials. RB&W has the answers to your questions.



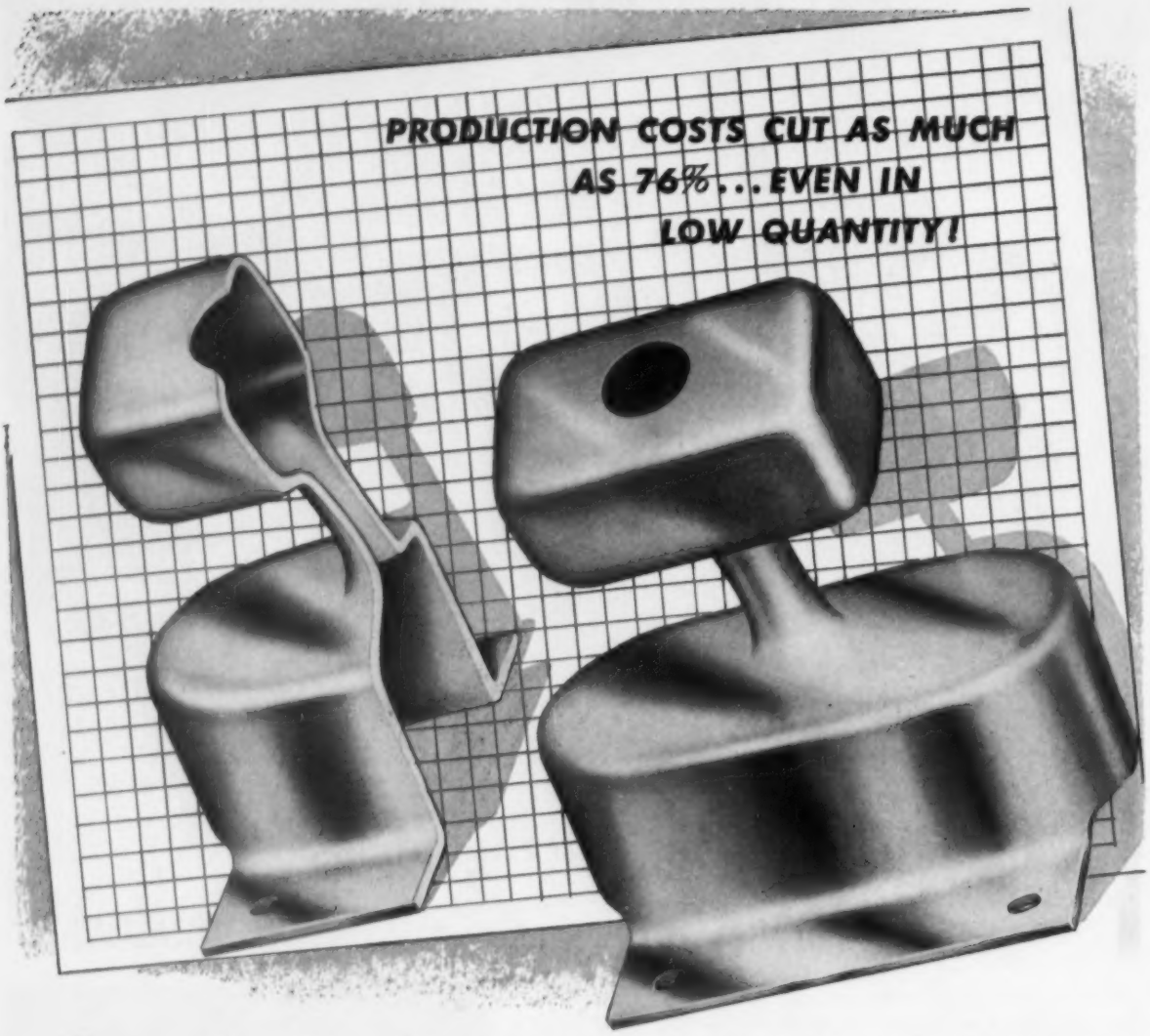
DETAIL VIEW of Hewitt-Robins vibrator, showing RB&W high-strength bolts which must resist shear stress as well as vibration. 4.8

See our insert on high-strength bolts in Sweet's Architectural and Industrial Construction Files.

RB&W **RUSSELL, BURDSALL & WARD**

109 YEARS MAKING STRONG THE THINGS THAT MAKE AMERICA STRONG

Plants at: PORT CHESTER, N.Y.; CORAOPOLIS, PA.; ROCK FALLS, ILL.; LOS ANGELES, CALIF. *Additional sales offices at:* ARDMORE (PHILA.), PA.; PITTSBURGH; DETROIT; CHICAGO; DALLAS; SAN FRANCISCO. *Sales agents at:* NEW ORLEANS, DENVER, SEATTLE. *Distributors from coast to coast.*



Complicated investment cast magnesium parts exclusively from Arwood

Shapes impractical or expensive to obtain by conventional methods can now be produced economically by investment casting in magnesium as well as other metals. Arwood can cast, at substantial savings to you, complex parts in difficult-to-form alloys.

Arwood's investment casting process quite often makes possible casting several sub-assemblies into a single part. On many parts, long cored sections can be cast with no draft. Dense, fine-grain parts require only minimum machining.

Our engineers will be pleased to go over your parts problems with you and help cut your own costs. Why not submit parts or prints to us for quotations? Consultation is free of obligation, of course.

Write for free literature describing the investment casting process.

CASE STUDY

METAL: Magnesium (QQ-M-55 Comp. AZ-92-A)
PARTS: Designed and cast as single unit.
QUALITY CONTROL: Chemical and Physical affidavits furnished. Test Bars submitted. Produced under X-ray control.

ADVANTAGES: (as investment casting) Cost drastically reduced. Light weight. Smooth surfaces—no welding seams or parting lines.

ARWOOD
PRECISION CASTING CORP.
67 WASHINGTON STREET • BROOKLYN 1, N. Y.
PLANTS: Brooklyn, N.Y.; Groton, Conn.; Tilton, N.H.; Los Angeles, Calif.

Automotive Production

(U. S. and Canada Combined)

WEEK ENDING	CARS	TRUCKS
Jan. 29, 1955	167,946	24,167
Jan. 22, 1955	167,071	23,167
Jan. 30, 1954	119,094	24,560
Jan. 23, 1954	121,157	25,584

*Estimated. Source: *Ward's Reports*

Only two other groups—water carriers and pipelines—could point to gains for the year. Water carriers had revenues of $382 million. up 12.3 pct and pipelines had returns of $603 million, for an increase of 7.3 pct.

Decreases were shown by motor carriers of passengers with a drop of 1.9 pct; Railway Express Agency, with a decline of 5.4 pct; steam railways, down nearly 5.9 pct; and the Pullman Co., down 14.7 pct.

Automation:

Ford has continuous line, but Chevrolet splits operations.

A basic difference between Ford and Chevrolet's concept of automation is revealed in engine lines employing Chevrolet's newly coined term of "segmented" automation.

What this means is that in manufacture of Chevrolet's new V-8 engine, the automatic operations are still there in transfer machines, automatic gaging, automatic chip-dumping and the like. However, each operation is separated from the next to guard against dangerous and costly downtime for maintenance and repair.

As a result, Chevrolet's new engine lines, which might have been considered push button operations a few years ago, still utilize much more manual handling than do some others in the industry.

Automate All Handling

Ford, on the other hand, goes to the extreme in automatic handling of engine blocks, both in the Cleveland plant and Dearborn.

At Ford, downtime is as much feared as at Chevrolet, but automatic shuttles from one parallel line to another, plus strategically placed banks guard continuity.

Actually, it is still automation, but of a different degree. While Ford men will defend their greatest possible utilization of automatic handling, others, as indicated by Chevrolet's modification, believe that it can be carried too far. Work quality does not appear to be a point of issue, but downtime is. In operations geared to the rates of Ford and Chevrolet lines, work stoppage is the most costly thing that can happen. Ford chooses automatic safeguards, Chevrolet holds the more conservative concept of individual segments, not necessarily connected.

Ford:

Executive promotions broaden staff to match firm's growth.

Top executives at Ford Motor Co. moved up last week in a general broadening of this expanding company's executive staff.

Ford's increased share of the market, creation of new divisions, and increased capital expenditures demanded, as President Henry Ford II put it, "closer executive supervision and direction and a wider spread of the heavy and growing management responsibilities in the company."

AUTOMOTIVE NEWS

Heading the list, Ernest R. Breech moved up from executive vice-president to chairman of the board of Ford Motor Co., a newly created position. Mr. Ford remains president.

Del S. Harder, the man who coined the word "automation" and was its leading exponent, was elected executive vice-president with supervision of the company's basic manufacturing groups. He was vice-president, manufacturing.

Heads Automotive Divisions

Lewis D. Crusoe, former vice-president and general manager of Ford Div., was named executive vice-president in charge of the three automotive divisions—Ford, Lincoln-Mercury and Continental.

Robert S. McNamara, 38-year-old former assistant general manager, replaced Mr. Crusoe as the Ford Div. general manager. Dwillard J. Davis, formerly director of manufacturing engineering, was elected vice-president in charge of manufacturing, a staff position.

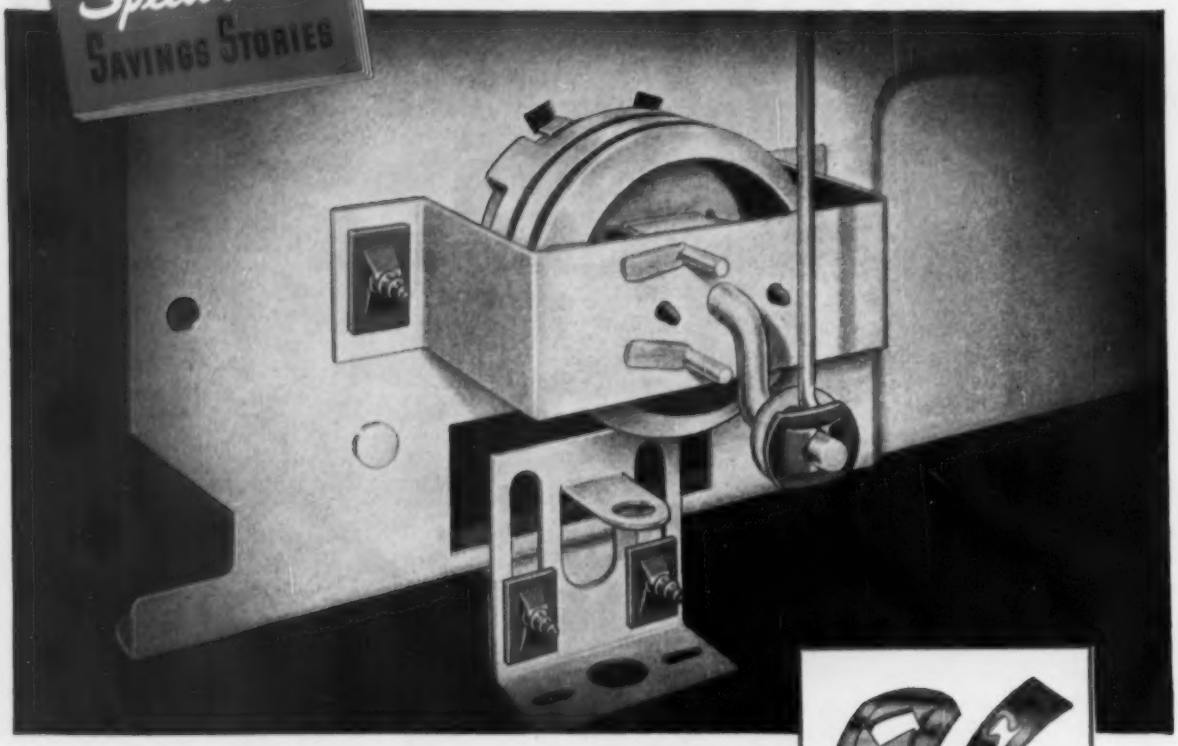
THE BULL OF THE WOODS — By J. R. Williams

TINNERMAN

Speed Nut®

SAVINGS STORIES

FASTEST THING IN FASTENINGS®



Chrysler Airtemp enjoys "refreshing" 40% cost saving!

New Casement Window Air Conditioner assembled at lower cost with 27 SPEED NUTS

Engineers of Chrysler's Airtemp Division, Dayton, Ohio, accepted many of the cost-saving recommendations in a Tinnerman Fastening Analysis Survey on their new Room Air Conditioner for casement windows. This led to the selection of 11 different types of SPEED NUTS to make a total of 27 attachments. The result: an estimated 40% saving in assembly costs over alternate fastening methods!

In addition to the Push-On and Flat Type SPEED NUTS used in the control panel assembly illustrated above, other SPEED NUT brand fasteners provide lightning-fast, corrosion-free, vibration-proof attachments on other sections of the new unit.

A Fastening Analysis of your product can lead to lower costs on current models, even greater savings on new or advanced designs. See your Tinnerman representative for complete details!

Push-on Speed Nut | Flat Type Speed Nut

SPEED NUT applications result in substantial savings in assembly time, cost of materials, and materials handling. For example, SPEED NUTS eliminate costly threaded inserts, make faster, easier attachments in blind locations, and permit greater design flexibility. A complete range of types and sizes available.

Write today for your copy of the new Tinnerman Fastening Analysis Service Bulletin Number 336: TINNERMAN PRODUCTS, INC., Box 6688, Dept. 12, Cleveland 1, Ohio. *In Canada:* Dominion Fasteners, Ltd., Hamilton, Ontario. *In Great Britain:* Simmonds Aerocessories, Ltd., Treforest, Wales. *In France:* Aerocessoires Simmonds, S. A., 7 rue Henri Barbusse, Levallois (Seine).

TINNERMAN Speed Nuts®

MORE THAN 8000 SHAPES AND SIZES

THIS WEEK IN WASHINGTON

See Healthy Economy in First Half

Administration's economists mark prosperity pattern through coming months . . . Predict slight easing in last half . . . Democrats will try for income tax cuts this year . . . Probe union funds—By G. H. Baker.

◆ ROBUST, solid business—right through the Spring. That's the way it looks now to President Eisenhower's pulse-takers.

All of the metal-producing and metal-consuming industries are in on the prosperity pattern of the next five to six months. Their volume of orders ranges from "good" to "terrific." Payrolls are high. Unemployment is correspondingly low. Retailers are enjoying brisk business, a marked improvement from '54 doldrums.

Easing in Second Half . . . Some slippage—nothing that could be termed a "recession" by any standard of business measurement—is likely to occur in the second half of this year. Administration business experts say it's nothing to get excited about. And the slowdown—when and if it comes—will by no means suffice to cancel first half gains.

See Lower Taxes . . . It's now a virtually sure thing that income taxes will be lowered next year via the higher-exemption route. Rates won't be lowered, but upping the exemptions will benefit nearly everybody and will be a particular bright ray for families.

Democrats would like to ram reductions through this year, not next year. They'd like to grab full credit for tax cuts, not let Ike and the Republican party have the credit in 1956, an election year.

No Balanced Budget . . . A balanced budget is no longer considered a *sine qua non* to tax reduction. The Treasury Dept. has softened its position, no longer insists that income and outgo be in balance before further tax cuts can be put into effect.

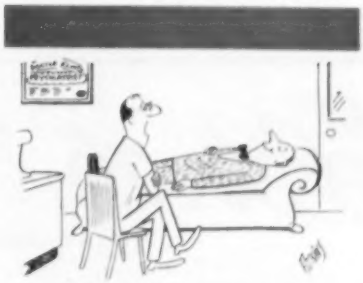
Republican leaders in Congress are determined to block—if they can — the Democrats' plans for voting tax cuts this year—even if the cuts are wrapped up in a package deal with legislation keeping corporation taxes and certain excises at their high wartime levels.

Probe Welfare Funds . . . As a result of a six-month-long probe of union welfare funds and how they are in some cases dishonestly managed, Congress is giving serious thought to legislating new rules governing the operation of such funds.

Senate and House committees looking into the management of welfare funds found recently that some of the money collected from union members as "welfare payments" has been frittered away in operations that have little or nothing to do with the welfare of the rank-and-file membership.

There's a growing belief that the union-management trusteeships provided for in the Taft-Hartley law are ineffective. Employers, too often, are to blame. In many cases, management has displayed absolutely no interest in the way the funds are handled.

A number of congressmen say the answer to these abuses is to require that all welfare funds be registered with a federal board, which would require annual financial reports in detail. And the board would be armed with far-reaching authority to examine the reports in detail, and to call for additional data in all suspicious cases. The "pitiless spotlight of publicity" would discourage "slick" operations, it is stated.



"With the global situation what it is, I suggest you remain in your little dreamworld."

Sell Rubber Plants . . . Government—and the taxpayers—would recoup $401.5 million of its $500 million investment in synthetic rubber producing facilities if Congress agrees to disposition of 24 of the 27 federal plants.

The Rubber Producing Facilities Disposal Commission is recommending to Congress that the 24 plants be sold for $285.4 million, plus $300,000 for miscellaneous equipment and $24.8 million for synthetic rubber inventories. Together with some $91 million the government has on hand in cash from the program, the taxpayers will retrieve 99.2 pct of the value assigned to the plants by a private engineering firm, and 96.6 pct of the total unrecovered investment in the program.

In addition, the Commission points out, sale of the plants—automatic in 60 days unless Congress intervenes — will further take the government out of competition with private industry.

Turn Page

"You cannot build today's products with yesterday's machines —*and be in business tomorrow!*"

Quote from speech by Dr. W. W. Gilbert of the General Electric Company before the Machine Tool Distributors Meeting, Cincinnati, Ohio. Oct. 19-20, 1954.

New No. 4

New No.12

H. P.* No. 36

Up here in Vermont, we believe that Dr. Gilbert's statement is particularly pertinent to the production of precision gears in quantity. In our 1955 line are 'beefed up' ultra modern Gear Shapers... ready for automatic operation... faster stock removal... working to the ultimate in commercial precision limits.

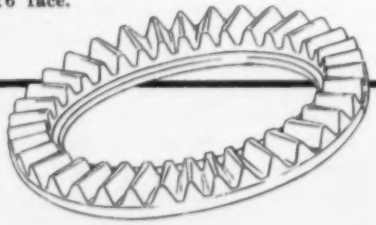
Latest Heavy Duty Gear Shapers—for Production Savings

High Speed No. 4 GS for record-making production on work up to 6" diameter x 2" face.

No. 12 a high-spindle-speed, fast feed machine for all-purpose gears to 12" diameter x 4" face.

No. 36 is in wide use for coarse pitch pinions and gears in all diameters to 36"x6" face.

**High Production*



THE Fellows GEAR SHAPER COMPANY

Head Office and Export Department: 78 River Street, Springfield, Vermont • *Branch Offices:* 319 Fisher Bldg., Detroit 2 5835 West North Avenue, Chicago 39 • 2206 Empire State Bldg., New York 1 • 6214 West Manchester Avenue, Los Angeles 45

The contracts negotiated by the Commission have been approved by the Attorney General as legal under the antitrust laws, the Commission says.

Two firms involved in the sale are the Koppers Co., which will pay $2 million cash for the alcohol butadiene plant at Kobuta, Pa., and the Food Machinery & Chemical Corp., which will pay $24.1 million for the petroleum butadiene plant at Houston, Tex. Others include the Firestone, Goodrich, Goodyear and United States rubber companies, and The Gulf, Shell, Phillips, Standard Oil, Cities Service and Continental oil companies.

Officials of the Federal Facilities Corp., which operates the government's business activities, say the proposed sale of the rubber plants will not interrupt delivery of synthetic rubber. All plants will be turned over on a full-production basis, and purchasers will buy inventories sufficient to keep a continuous flow of rubber to users.

The government will accept and deliver synthetic rubber up to and including April, when the transfer is expected to take place.

Competition:

Ike orders inventory of government in business.

All federal offices are soon to make the first complete inventory of what operations they conduct in competition with private enterprise as a result of a tough new directive issued by President Eisenhower through the Budget Bureau.

The directive orders the inventories be submitted to the Budget Bureau by April 15, and that an evaluation of the unnecessary competing manufacturing operations be submitted by July 15.

Evaluations of government operations in wholesale and retail trade, repair and business services, agriculture, fisheries, transportation and communications will be conducted later.

Test of whether competing services can "reasonably" be discontinued is: "that the federal government will not start or carry on any commercial activity to provide a service or product for its own use if such product or service can be procured from private enterprise through ordinary business channels."

The directive does not cover government's services for the public, such as power production, or the very smallest activities. In evaluating competing enterprises, the directive states, costs must be a factor, including a computation of the taxes which government enterprises do not pay.

Seaway:

Ike asks added $22.8 million for work in fiscal 1956.

President Eisenhower is asking Congress for permission to spend another $22.8 million for further work on the St. Lawrence Seaway project in the fiscal year beginning next July 1.

With completion slated for 1959 Seaway construction will be at the one-quarter mark by June 30, 1956, the President estimates.

The $22.8 million will go for land acquisition; engineering and design; relocation of property, including a highway, a railroad and a power line; excavation for locks and canals; dredging, and beginning construction of locks, dikes and other facilities. Also requested in the budget is $150,000 for administration of the joint U. S.-Canadian board of Army civil engineers which reviews plans and coordinates construction.

"Put it in the Rush basket. Hardly anybody bothers to look there."

WASHINGTON NEWS

The Seaway Corporation meets its expenses by selling bonds to the Treasury. It can sell up to $105 million worth, which will be repaid out of toll revenues over the next 50 years.

Want Damage Action

On the question of damage to waterfront property by Seaway construction, New York Reps. Kenneth B. Keating and Harold C. Ostertag have written Chairman Len Jordan of the International Joint Commission for the project to ask the conditions, responsibility and means for making payment on claims.

Mr. Keating is renewing his move for an "appropriate tribunal" to handle the expected claims. He believes it will take time to get Canada to cooperate in the setting up of such a body.

Mergers:

FTC studying effects of new combines in autos, metals.

Effect of the current "wave of mergers," rather than the number, is going to be the basis for any new action taken by the Federal Trade Commission.

FTC for the last three months has been studying the magnitude and significance of mergers and the extent to which they may affect competition in specific market areas. Among the areas drawing the most attention are the automotive and primary metals industries.

There are three types of mergers which may be illegal—1.) horizontal, involving two or more competitors in the same area; 2.) vertical acquisitions, in which a firm acquires the assets of businesses above or below it in the same line of production, and, 3.) conglomerate, where companies in different lines combine. It is the conglomerate which is causing much of the apprehension. Combinations among unrelated businesses suggest diversification need behind mergers.

Bound to prevent damage

HOW YOU SAVE WITH BRAINARD TWO-WAY STRAPPING SERVICE

Brainard salesman Jim Brennan demonstrates how strapping tape insures a safe load . . protects facing of concrete blocks. Full load can be secured in a few minutes.

STRAPPING TAPE

STEEL STRAPPING

In the same cement block yard, Brennan recommends Brainard steel strapping for small sample block shipments. Compact package provides maximum protection in handling.

Photos courtesy Pacinga, Inc., Chicago, Ill.

● Why does Brainard sell both steel strapping and strapping tape? Because Brainard knows there is a place for *both* methods in most shipping operations. Thus, Brainard can give you *unbiased* recommendations . . . and complete service.

For a Brainard strapping analysis, call your nearby Brainard office today, or write Brainard Steel Division, Dept. I-2, Griswold Street, Warren, Ohio.

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SHARONSTEEL

STEEL DIVISION
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COMPLETE STRAPPING SYSTEMS & MATERIALS • WELDED STEEL TUBING • ELECTRO-GALVANIZED STRIP STEEL • SCAFFOLDING • PALLET RACKS • BUILDING PRODUCTS

Offices in principal cities throughout the U. S.

WEST COAST REPORT

Mexican State Offers Growing Market

Lower California needs more autos, farm machines and home appliances . . . Imports from U. S. should rise 25 pct in next five years . . . Chrysler ups Coast buying . . . Kaiser and Reynolds build new plants—*By R. R. Kay.*

◆ PACIFIC SOUTHWESTERN manufacturers may not be aware of a good and growing market for metalworking products right in their own back yard. Neighboring Mexico's state of Baja (Lower) California, which borders southern California, 16 miles south of San Diego, is ripe for more U. S. farm and construction equipment, machinery, tools, and home appliances.

Eager eyes turn our way to fill the needs of a growing population, now 300,000, an expanding agriculture-based economy, a rising standard of living, and an intensive road-building program.

Want U. S. Plants . . . The Mexican government's policy of spreading the welcome mat for U. S. manufacturers to set up plants below the border should be a big factor in future growth. Foreign-trade experts see our business with Baja California—about $100 million last year—increasing at least 25 pct in the next five years.

It's a free trade zone, so U. S. manufacturers can sell most items duty-free. U. S. 1954 exports reached $65 million, imports $35 million. Fifteen million U. S. visitors entering Baja California each year leave behind 50 million tourist dollars, much of which the Mexicans use to buy from us.

Autos Rank First . . . Automobiles, trucks, buses, and automotive parts rank first among the major exports to Baja California. Agriculture, construction, and mining operations all need motive power. Pumps, new and used tractors and parts are big sellers.

Increasing cotton production in the Colorado River delta, around the border town of Mexicali, needs a lot of farm implements; and there's a market for cotton seed oil mill machines, gins, and presses.

Self-propelled harvesting combines, plows, and listers are also high on our export list. Construction and mining industries are good customers for our reinforcing bars and machinery.

And in the homes, latest export figures show, south-of-the-border housewives, like ours, are fussing at their husbands for shiny, new electric refrigerators, cooking stoves, air-conditioning units, television sets, and kitchen gadgets.

Chrysler Will Buy . . . Good news for West Coast automobile parts and components manufacturers from the top man at Chrysler Corp., L. L. Colbert. He told THE IRON AGE his company will increase its purchasing on the West Coast if it can get Chrysler-quality products at competitive prices. Last year, Chrysler spent more than $10 million in new equipment and improvements on their Los Angeles assembly plant. With increased capacity now going full blast, the company wants to buy more parts and components close to the plant.

"Why should I go to work to support a bum like me?"

Aircraft sub-contractors whose backlogs are dwindling would do well to get in touch with Chrysler's parts purchasing department in Los Angeles.

Plan Big Expansion . . . Chemicals Div. of Kaiser Aluminum & Chemical Corp., Oakland, Calif., is embarking on a major expansion with a basic refractories plant to go up at Columbiana, Ohio. Construction of the $4-million facility, on a 100-acre site, should begin in 60 days.

The plant will be in operation late this year, according to D. A. Rhoades, vice-president and general manager. Its three producing plants in California turn out high temperature refractory materials for the steel, copper, glass, and cement industries.

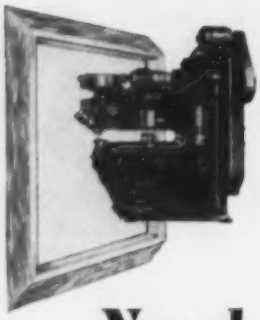
Start New Plant . . . Aluminum industry in the Pacific Northwest continues to expand—with welcome news from Reynolds Metals Co., which will start building a new mill products fabricating plant by mid-1955. Although the line of products is not yet determined, aluminum foil, cable, castings and rod are strong possibilities. A rolling mill is not planned. Troutdale, Ore., and Longview, Wash., are likely sites for new construction.

PUNCHES TO MEET ALL NEEDS

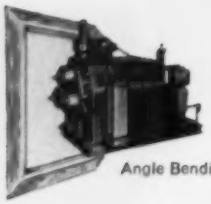
UNIVERSAL PUNCHES ...4 Sizes, 120—150—235—300 tons, 18½ and 28½" throat

SINGLE END PUNCHES ...7 sizes, 25 to 760 tons

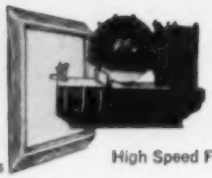
HORIZONTAL PUNCHES ...2 sizes, 55 and 120 tons



Rotary Shears



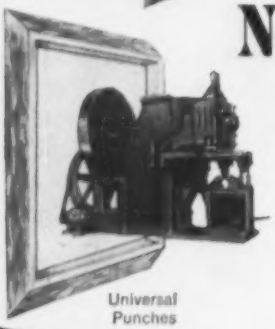
Angle Bending Rolls



High Speed Friction Saws

Typical of Versatile Kling Metal Working Machines

Nearly 50 Different Kling Punches



Universal Punches

To Help You Cope With Today's Changing Production Conditions

Yesterday's machines will not meet today's new conditions. Kling, with more than 60 years' experience, is constantly designing, developing and improving new-type, more advanced metal-working machines to meet these new situations.

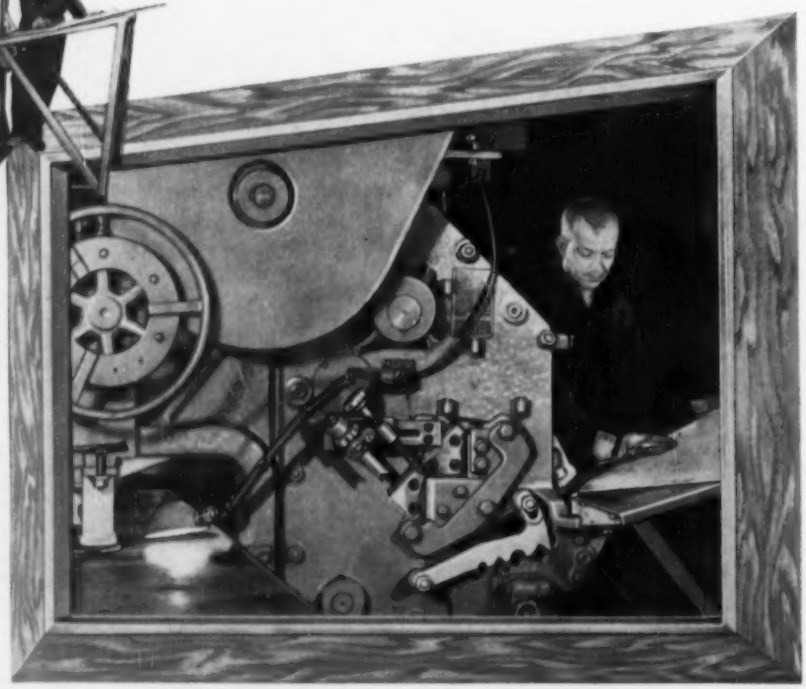
Cop a "Production Oscar" With

KLING COMBINATION SHEAR, PUNCH and COPER

Like Cherry-Burrell, Speed Production, Reduce Costs

According to Cherry-Burrell, this one Kling Combination speeds production and cuts costs by doing ALL these jobs: Bar Shearing, Punching in Angles, Coping Angles, Notching, Plate Slitting, Angle Shearing, Punching in Plate.

Kling Combination Shear, Punch and Coper



THERE ARE 3 SIZES OF THE KLING COMBINATION TO MEET VARYING PRODUCTION REQUIREMENTS

	PUNCHING CAPACITY
No. 3	11/16" through 1/2" 13/16" through 3/8"
No. 4	13/16" through 3/4" 15/16" through 5/8"
No. 7	1-5/16" through 1" 1-7/16" through 7/8"

In addition to punching, this "jack-of-all-jobs" does a dozen other operations with standard and special attachments. Two men can work simultaneously at opposite ends on the same or different jobs so that you practically get 16 hours work from an 8 hour day.

Since 1892

Kling

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Write for descriptive bulletins on type machine in which you are interested.

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Makers of Friction Saws; Shears; Punches; Combination Shear, Punch and Coper; Angle and Plate Bending Rolls.

Export Distributors: Simmons Machine Tool Corporation, 50 E. 42nd Street, New York 17, N. Y.

MACHINE TOOL HIGH SPOTS

Automation Needed to Compete Today

Dodge's Newberg sees quality, output, safety and space benefits . . . warns against hopes of immediate cost reductions . . . Says machine maintenance jobs will add to labor force . . . New strides predicted—By *E. J. Egan, Jr.*

◆ "IN THE BIG economic picture, the economics of automation are harsh but simple: Automate or die." That unequivocal statement climaxed a paper recently presented at the Society of Automotive Engineers' Golden Anniversary meeting in Detroit. Its author: W. C. Newberg, President of Chrysler Corp.'s Dodge Div.

Admitting that initial cost of automation is high, the speaker said that the savings to be gained from its installation are clearly not be found in the initial cost. He advised his audience to look beyond the price tag into some savings areas which are generally misunderstood.

Finds Many Savings . . . Mr. Newberg grouped these savings potentials into definite but diverse areas. They included employee safety, floor space, product quality and production rate.

Where safety is concerned, the speaker pointed out that it is not just a matter of keeping life and limb intact. He added that reductions in the number and severity of accidents reduce workmen's compensation costs and lost time. And he also asserted that a safe plant attracts willing workers.

Use Less Space . . . Dodge Div. has realized important space savings through the use of automated lines. Mr. Newberg maintained one such line is making 2400 V-8 engines a day in the space formerly used to make 1500 six-cylinder engines daily. And the speaker stressed that this meant making sets of eight pistons, pins, connecting rods, etc., for each engine instead of six. In addition, the new line makes two cylinder heads instead of one, plus a number of additional parts not used in the old six-cylinder engines.

Turning to automation savings in the area of quality, Mr. Newberg told his audience that better quality was demanded by the competitive times. He said that since the automated machine knows only one way to do its work, the end product must be more uniform. Installing an automated setup solely for quality improvement would be the best single investment a company could possibly make, he added.

Speed Up Production . . . As for speeding up production through automation, Mr. Newberg thought that the virtue of using machines closer to full rated capacity was self evident. But he mentioned that these gains were even more desirable since they do not increase the operator's physical work load, but actually lower it in many cases.

"He has a mechanical mind all right. He just keeps forgetting to wind it up."

Switching to another area, Mr. Newberg deplored the fact that some manufacturers consider automation valuable only to the extent that it will reduce productive labor cost, he maintained that "no policy could be more shortsighted. . . . It simply will not pay off in the long run."

Will Increase Employment . . . The speaker agreed that manpower could be reduced on some operations by installing automated equipment. But he said the overall effect will probably be to increase total employment. These gains will come in the so-called non-productive labor category, which includes maintenance personnel and technical specialists.

Taking a peek at the future, Mr. Newberg said that a great deal remains undone and untried in the design and construction of assembly machines. These problems are four times as great as those involved in automated manufacturing equipment. But he said that a start has been made, and mentioned Dodge Div.'s application of automation to body-pillar welding.

Show New Press . . . An 8000-ton extrusion press which will form 1000-lb aluminum billets into aircraft forms and shapes, was unveiled yesterday at Nordberg Mfg. Co., Milwaukee. The press, built by Nordberg for Loewy Construction Co. of New York, will be shipped to the air force plant at Hale-thorpe, Md., operated by the Kaiser Aluminum and Chemical Co.

PROGRESS

...at Northwestern Steel and Wire

One of the two 22-foot Lectromelt Furnaces at Northwestern Steel & Wire Company, Sterling, Illinois, producing the steel about which they proudly say, "You expect more from Electric Steel —and you get it!"

- 1936 Two 12-ton Lectromelt Furnaces
- 1941 Two 50-ton Lectromelt Furnaces
- 1952 Two 150-ton Lectromelt Furnaces

CONFIDENCE in Lectromelt* equipment has been inspired by Northwestern's nineteen years of experience with these furnaces. As their demand for high quality steel rose throughout the years, they added Lectromelt Furnaces as you see here to produce that steel—efficiently, economically and with the high degree of uniformity they require.

Catalog #9 tells you about Lectromelt Furnaces. For a free copy, write Pittsburgh Lectromelt Furnace Corp., 312 32nd St., Pittsburgh 30, Pa.

Manufactured in...GERMANY: Friedrich Kocks GMBH, Dusseldorf...ENGLAND: Birlec, Ltd., Birmingham ...FRANCE: Stein et Roubaix, Paris...BELGIUM: S. A. Belge Stein et Roubaix, Bressoux-Liege...SPAIN: General Electrica Espanola, Bilbao...ITALY: Forni Stein, Genoa. JAPAN: Daido Steel Co., Ltd., Nagoya

*REG. T. M. U. S. PAT. OFF.

MOORE RAPID

WHEN YOU MELT... *Lectromelt*

The Iron Age SALUTES

Samuel P. Hull

His career demonstrates that a man can function as a top sales executive and take a leading part in the development of his industry while still maintaining balanced outside interests.

When he is not taking part in amateur theatricals, Sam Hull finds time to head up sales at the Worcester Stamped Metal Company, assume a leading role in activities of the Pressed Metal Institute and serve as president of the Worcester Sales Executive Club. His career exemplifies the saying: "Give a job to a busy man and he'll get it done."

Sam's abilities and energy have brought him steadily increasing responsibilities with his own firm and in industry-wide functions. Joining the Worcester Company in 1942, he is now vice-president, sales manager, and a director.

His success in more general activities has been equally impressive. Final recognition of his contributions to the whole industry came with his election as president of the Pressed Metal Institute for the 1953-54 term.

A native of Millbury, Mass., Sam has lived and worked in New England most of his life. He is a graduate of Worcester Academy and Bowdoin College. After college he went with the American Optical Company, Southbridge, Mass., in the sales promotion department.

He spent two years with the Warner and Swasey Company in Cleveland, then returned to New England as sales manager for a beverage manufacturer. Several years later, in 1942, he joined Worcester Stamped Metal.

Sam has been a red-blooded competitor within the pressed metal industry but has never lost sight of the need for concerted action by the industry as a whole. He has done a personal selling job for pressed metals and has organized effective cooperation within the industry on an increasingly broad scale.

The success of his efforts is indicated by the growing importance of his duties with the Pressed Metal Institute. He served on the public relations and executive committees. He was chairman of the New England District and served for two years on the board of directors. He was elected vice-president, then was elevated to the presidency last year.

Sam is a busy man but he is not all business. He still shoots a good game of golf and will catch a few fish on trips with his wife and two children.

HYDRAULICS FOR MOBILE EQUIPMENT

VOL. 2

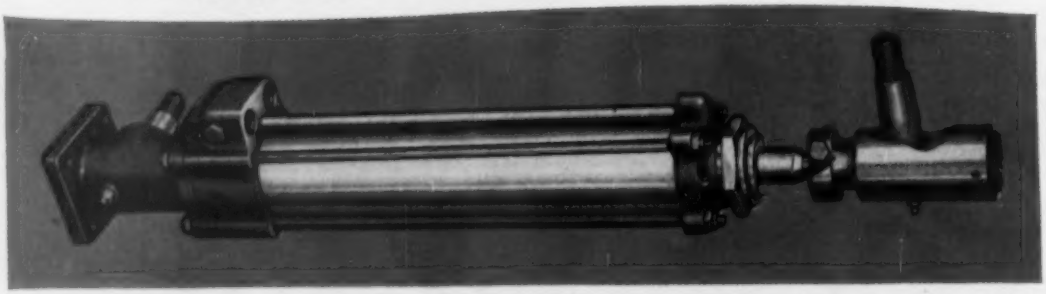
Mobile Equipment News

VICKERS INCORPORATED, DETROIT, MICHIGAN

IMPROVES PERFORMANCE • CUTS COSTS

NO. 8

New! VICKERS® HYDRAULIC POWER STEERING BOOSTER...SERIES S23



LATEST DEVELOPMENT in POWER STEERING for TRUCKS, BUSES, MATERIALS HANDLING VEHICLES, ROAD CONSTRUCTION and MINING MACHINERY

More compact . . . improved in operating characteristics . . . this new Vickers Steering Booster, Series S23 is an important new development in power steering for many vehicles. Application is much easier because it requires less space . . . and ultimate costs are substantially lower. Series S23 thus opens the way to fingertip ease of steering for a wide range of additional vehicles.

Like the preceding models, Series S23 has hydraulic lock against road shock. Bumps, chuckholes, blown front tires, obstructions, etc., cannot spin the steering wheel or jerk it out of control. This is a safety factor of great importance.

Series S23 Boosters are provided either with (Model S23R) or without (Model S23N) an integral relief valve. Model S23N is used with Vickers VT16 and VT17 pumps that have integral volume control and relief valve. When the larger volume Series V200 pump is used and a volume control is required in the circuit, the S23N is used with a separate combination valve (see Series FM2 below). Model S23R is used with the Series V200 pumps that have no integral valving, for applications where a volume control is not required.

MORE VERSATILE INSTALLATION

In Series S23 Boosters, the servo ball stud housing is symmetrical, and can be assembled in any one of four positions. This and the compactness of the Booster makes application easier . . . increases the number of applications which can be made without major engineering changes. Series S23 Boosters can be mounted interchangeably with Models S6-277 and S6-279 Boosters.

REQUIRES LESS SPACE

The new booster has been reduced in size by the redesign of the servo control valve. The tube connecting the servo valve to the rod end has been relocated and is now on the same side as the fitting connection. As a result of these changes, Series S23 requires less space . . . works in closer quarters.

ASK FOR NEW BULLETIN M5106

7062

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VICKERS® VOLUME CONTROL and OVERLOAD RELIEF VALVE

Five sizes of Series FM2 Valves were developed primarily for hydraulic power steering on trucks, buses and materials handling equipment where the pump does not include a volume control valve. The FM2 improves steering booster performance by providing a relatively constant volume of oil regardless of engine speed variations. An integral relief valve is included.

ENGINEERS AND BUILDERS OF OIL HYDRAULIC EQUIPMENT SINCE 1921

The Iron Age INTRODUCES

FRANCIS C. WEEKS, becomes president, Lamson Corp. of Delaware.

CARL F. DIETZ, becomes chairman of the board, Lamson Corp. of Delaware.

JAMES F. DOHERTY, elected vice-president in charge of manufacturing, The American Screw Co.

GLENN P. BAKKEN, elected a director and executive vice-president, Chase Brass & Copper Co., Inc., Waterbury.

John N. Beckley, named vice-president and eastern district manager, **The Austin Co.**

Louis McDonald, elected vice-president and technical director, **Kelite Products, Inc.,** Los Angeles.

Byron Hughey, appointed assistant to the vice-president, **The Youngstown Sheet & Tube Co.,** Youngstown, Ohio.

R. J. Gorecki, becomes director, **Raybestos-Manhattan, Inc.;** and **H. H. Burrows,** also named vice-president—rubber sales.

Orson A. Kinnery, becomes director of military products, Aluminum Div., Adrian, Mich., **Bridgeport Brass Co.**

John H. Faunce, Jr., becomes director of market and commercial development, **Lukens Steel Co.,** Coatesville, Pa.

Arthur M. Rogers, and **George A. Goss, Jr.,** become assistant to the vice-president and general manager of main plant operations, **Scovill Mfg. Co.,** Waterbury, Conn.

Arch Miller, named manager of the Tin Mill, **Weirton Steel Co.;** and **George E. Hugus,** named assistant manager. **Glenn W. Gould,** appointed assistant general superintendent.

B. G. Witty, becomes head of newly formed industry application section, **Allis-Chalmers Mfg. Co.,** General Machinery Div.

Edwin E. McConnell, elected treasurer, **Norton Co.; William H. Perks,** appointed controller; **Robert D. Lawson,** elected to new position of vice-president and sales manager, Grinding Machine Div.; **Richard Prouty,** becomes secretary.

William S. Stephens, becomes application engineer, Materials Handling Dept., **Snytron Co.,** Homer City, Pa.

Robert L. Gove, appointed sales engineer, Detroit office, **Allen-Bradley Co.,** Milwaukee.

Edward D. Bickford, appointed manager of sales, Cleveland district, **Bethlehem Steel Co.,** Bethlehem, Pa.

George Price, becomes sales manager, Cleveland territory, American Brakeblok Div., **American Brake Shoe Co.**

Richard D. Jenkinson, Jr., named district manager, **Pittsburgh Steel Co.,** Warren, Ohio, sales office.

Robert G. Page, appointed manufacturing engineering specialist, Distribution Assemblies Dept., **General Electric Co.,** Plainville, Conn.

Louis Sirotkin, appointed metals buyer, **Bohn Aluminum & Brass Corp.,** Detroit.

Robert Neilson, appointed engineering specialist, **Baldwin-Lima-Hamilton Corp.,** Philadelphia.

A. S. Burgoyne, promoted to manager, Domestic Gage Sales, **Niles-Bement-Pond Co.; A. F. Miller, Jr.,** becomes manager of domestic cutting tool and precision parts sales; and **J. B. Wilkie,** named assistant manager—cutting tool and gage divisions.

Sidley O. Evans, appointed to newly created position of manager of tubing operations, **The Babcock & Wilcox Co.,** Tubular Products Div. plant in Beaver Falls, Pa.

Robert D. Barron, appointed manager, National plant, **The National Radiator Co.,** Johnstown, Pa. He succeeds **John E. Harris,** who has been named manager of engineering, Viking Air Conditioning Div., Cleveland.

H. J. Kennedy, appointed manager-Galvanized Ware Sales, Container Div., **Jones & Laughlin Steel Corp.,** Pittsburgh.

J. P. Jung, appointed regional manager, **Cummins Engine Co., Inc.,** Columbus, Ind.

J. B. Howard, appointed assistant general manufacturing manager, Lincoln-Mercury Div., **Ford Motor Co.,** Detroit.

Paul D. Sullivan, named assistant sales manager, Le Roi Div., **Westinghouse Air Brake Co.,** Milwaukee.

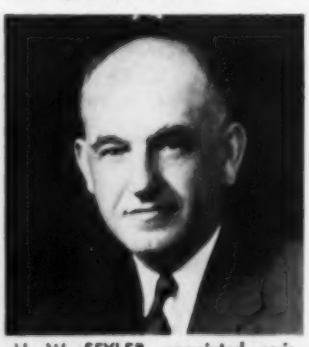
Edgar L. Landen, appointed assistant commercial sales manager, **U. S. Steel Corp.**

G. C. Mitchell, appointed staff executive, **Chrysler Corp.,** Central Purchasing Dept., Detroit.

S. R. ZIMMERMAN, JR., appointed vice-president, Raybestos-Manhattan, Inc.

M. A. JOULSOHN, elected vice-president, Torrington Mfg. Co., Torrington, Conn.

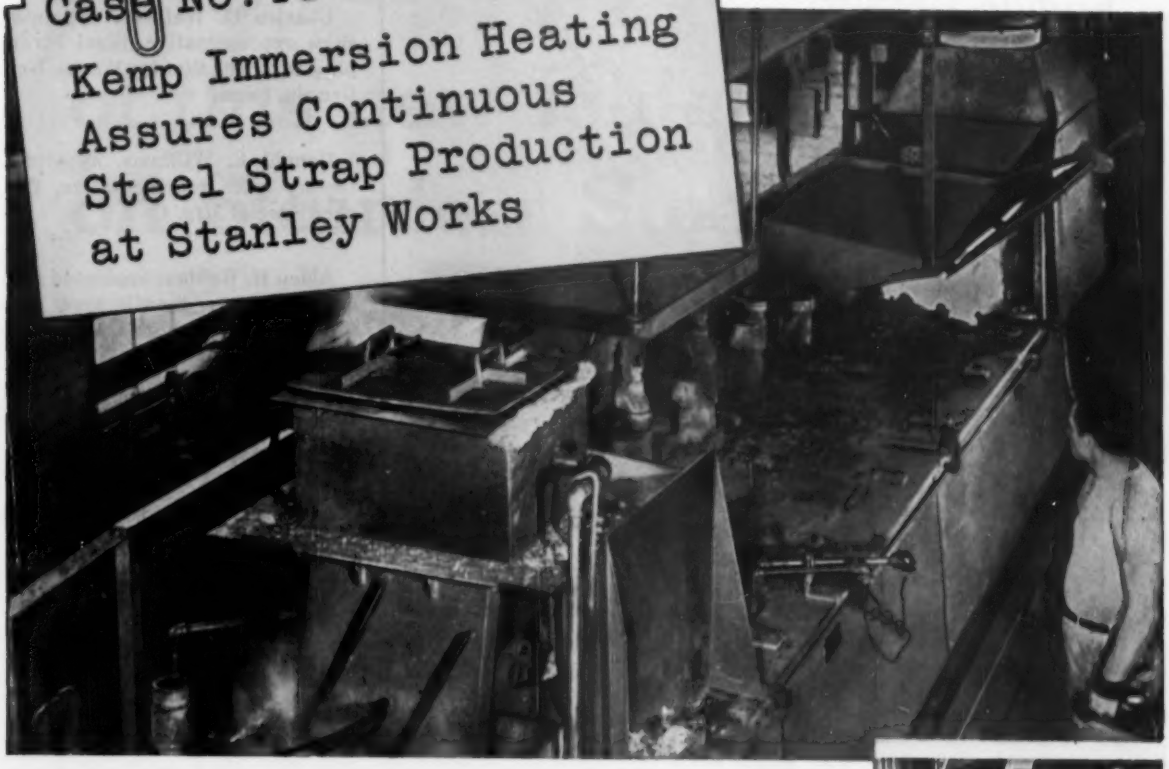
G. C. SALTARELLI, promoted to vice-president and general manager, Automotive Div., Houdaille-Hershey Corp., Detroit.



H. W. SEYLER, appointed assistant vice-president, Coal Chemical Operations, U. S. Steel Corp.

Case No. 44

Kemp Immersion Heating Assures Continuous Steel Strap Production at Stanley Works



How Stanley doubled steel strap capacity overnight . . . slashed fuel costs, too

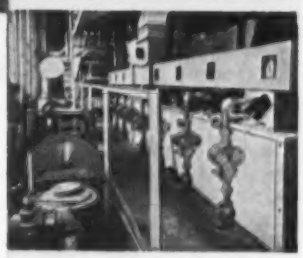
Today this bustling division of the famous Stanley Works at New Britain, Conn., turns out steel strapping on a 24 hour basis. Starting with raw, high carbon steel on giant spools, strap is semi-annealed, finished, coated and rewound again for shipping in one *continuous* process. New rolls of raw steel are simply spot-welded to the ends of rolls to eliminate any interruption.

Kemp Eliminates Bottleneck

From an output limited by the capacity of a gas underfired pot, production was doubled on the installation of a 32 ton Kemp Immersion Melting Pot. In addition, Kemp's *greater* heating surface, *faster* heat recovery, *lower* dross formation and *accurate* temperature controls meant real savings in fuel costs. In the words of Mr. Harold Heckman, plant foreman, "Through quicker heating of this pot, we are able to maintain production schedules." And unlike underfired pots, Kemp units eliminate open flame hazards and excessive room temperatures.

Let Kemp Help with Your Problems

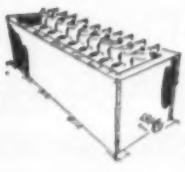
If you're dissatisfied with your present heating or melting equipment, consult Kemp first before you make any changes. Let Kemp Engineers show you how they can solve your tempering, annealing, descaling or coating problems quickly and easily. Then just like the Stanley Works, you'll be *time* and *money* ahead.



Rear view of Kemp Pot at Stanley Works shows gas feed lines, fire checks, and the Kemp Carburetor (left). Part of every Kemp installation, this carburetor assures complete combustion . . . without waste . . . without tinkering. Just set it, and forget it.

For more complete facts, ask for Bulletin IE-11. Write: **C. M. KEMP MFG. CO., 405 East Oliver Street, Baltimore 2, Md.**

KEMP OF BALTIMORE



IMMERSION MELTING POTS

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PERSONNEL

Charles D. Watrous, appointed sales representative, Steel Strapping Div., **The Stanley Works,** New Britain, Conn.

Donald E. Williams, appointed factory sales representative, **Fischer Special Mfg. Co.**

Alden H. Webber, appointed field sales engineer, Seattle area, **The Bristol Co.,** Waterbury, Conn.

John A. Fyffe, appointed sales representative, **Hooker Electrochemical Co.,** Niagara Falls, N. Y.

Atwood Fuller, appointed sales manager, Chicago area, **Baldwin-Lima - Hamilton Corp.,** Philadelphia.

Kenneth Kelley, appointed to sales department, **Ziv Steel & Wire Co.,** Toledo branch office and warehouse.

E. J. Somerville, appointed as manufacturers' representative in the State of Illinois, Horton Chuck division of **The Horton & Son Co.**

OBITUARIES

Milton J. Karp, 60, president, **Karp Metal Products Co.,** Brooklyn, recently of a heart condition.

James G. Thimmes, 60, international vice-president, CIO United Steel Workers of America.

Charles H. Cecil, 57, formerly executive vice-president, **Northwestern Steel & Wire Co.,** Sterling, Ill.

Louis F. Ehrke, 30-year employee of the Research Dept., **Westinghouse Electric Corp.'s** Lamp Div., Bloomfield, N. J., recently.

Henry J. Mittelstaedt, sales manager, **Hanna Furnace Corp.,** suddenly.

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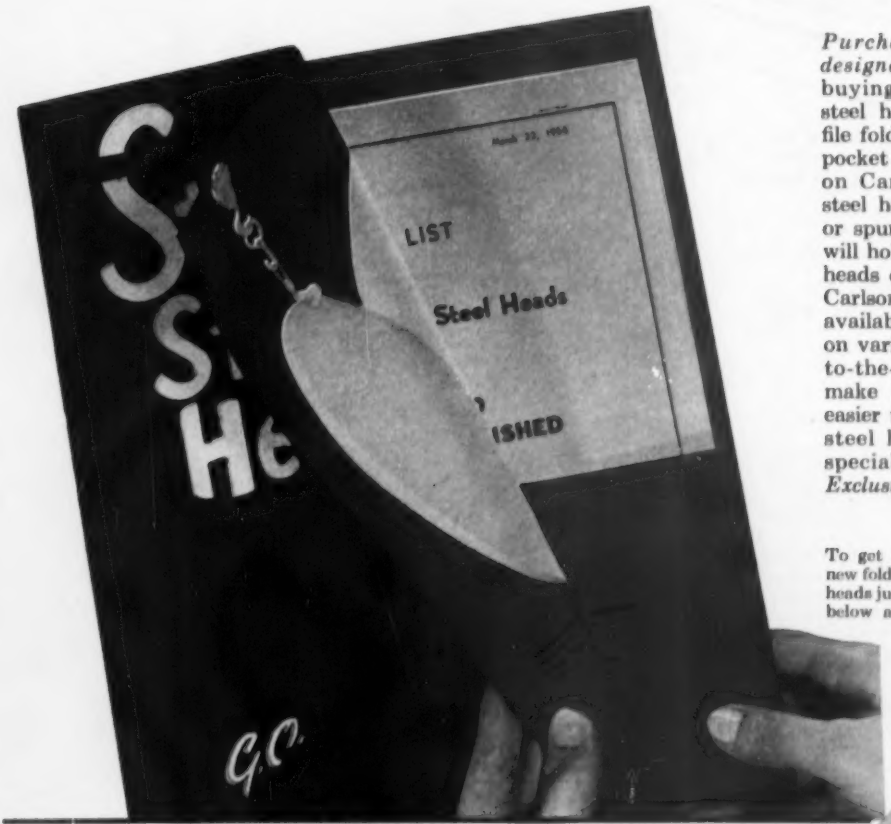

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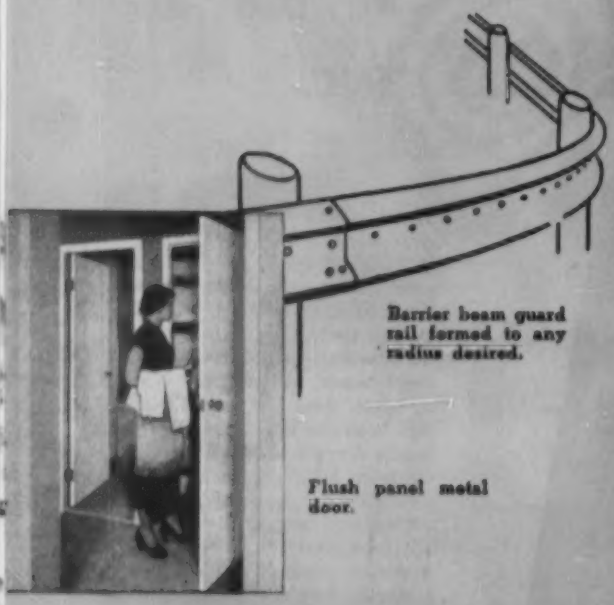
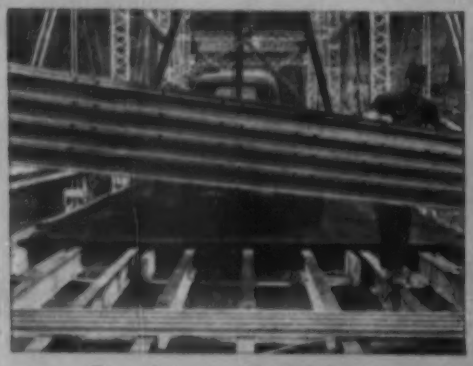
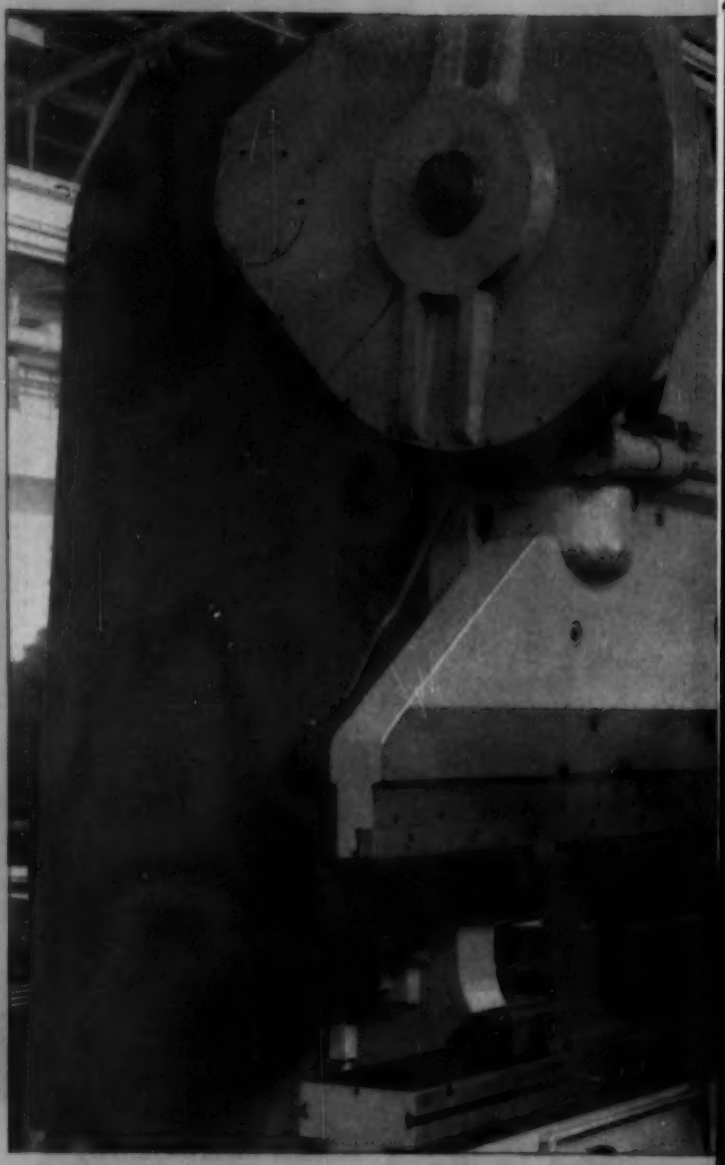


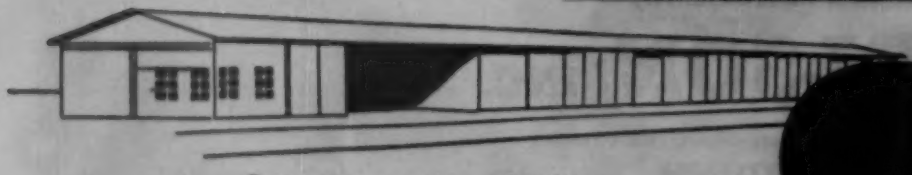
Barrier beam guard rail formed to any radius desired.

Flush panel metal door.



Formed structural bridge flooring



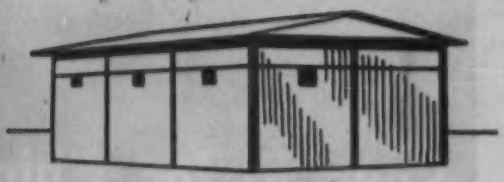


Permanent yet portable steel building

PRESS BRAKE

UNITED STEEL FABRICATORS, Inc.

Photos courtesy of United Steel Fabricators, Inc., Wooster, Ohio



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Use less stock—

TUBE FORGING Lowers Fabricating Costs on Hollow, Shaped Parts

S. D. JOHNSON, Works Manager, Struthers Wells Corp., Titusville Div., Titusville, Pa.

◆ Increased capacity for "tube forging" is widening its application in machine and structural parts . . . One of its important advantages is in shaping large and thick-walled tubes close to finished size requirements . . . Where applicable, it can achieve savings in material and metal removal costs.

FIG. 1—Straight tube is inserted into die. Manipulator feeds and slightly rotates work.

♦ INCREASED capacity for "tube forging" or shaping of tubes is giving industry a broader field for application of the process to design, production and cost problems in machine and structural components.

Machines of greater capacity and unique design are now available for a piercing, drawing, sizing, forming and reducing an ever increasing size range of mechanical and pressure tubing. Major inroads have been made to supplant comparatively expensive hollow-bored forgings in many applications.

With the use of specially-designed dies and a mammoth hydraulic press along with modern handling equipment Struthers Wells Corp. has extended even further the size range of products ordinarily availabie from seamless steel tubing or pipe.

Processing differs somewhat from cold sizing, drawing or reducing in that the tubing is worked at plastic temperatures inducing circumferential and longitudinal flow of the metal to conform to the die contour while the dies are alternately opened and closed.

The tube is fed further into the die and slightly indexed or rotated each time the die opens. The end of the tube which first enters the die is progressively made smaller as the tube proceeds through the die until the final desired diameter or shape is obtained.

The method is primarily a combination of hot forging or compression forming and swaging operation in a closed die.

Tubing is hot-worked

Unlike other processes the metal tube is not drawn through dies or over mandrels, pierced, hammered or spun. One of its important advantages is its capacity to shape large and extremely thick-walled tubes into products precisely to or near finished shape and size.

Fabricating may be likened to an enormous swaging machine where tubing to 24 in. diam and all wall thicknesses is hot-worked by compression forming to a variety of shapes such as long tapers, graduated diameters and nosed, flared, flanged, upset or expanded ends.

When necessary a mandrel may be used to control wall thickness and the inside configuration.

The metal in the tube is formed entirely by compression while at or near forging temperature, which lends the optimum in true forged quality steel to the end product. The pressure and heat make possible hitherto impractical reductions in size ration achieved as in nosing or steep angle tapering of heavy tubing.

Some of the many applications include 30° included angle cone sections and 12-ft long tapered rollers produced from 14 in. diam Schedule 100 (15/16-in. wall) seamless steel tubing with a constant taper over its entire length to 10 in. diam on the small end.

In forging or swaging these tapered rollers at Struthers Wells, a single split die contoured to the desired final tube size and shape is used. A quantity of tubing stock to constitute a run is gas cut to predetermined lengths allowing for a small amount of handling stock and eventual lengthening. These tube sections are loaded side-by-side in a large car-type gas fired forging furnace. In about 1 hour the stock is heated to 2000°F under closely controlled conditions to minimize scaling and avoid any other adverse metallurgical effects.

The forging furnace is immediately adjacent to the forming press so that special porter bars or a 600 lb manipulator can quickly remove the heated stock from the furnace and insert it in the die with little loss of time or temperature. Simultaneously with removing a hot tube, a replacement tube is added to the car to maintain a constant furnace load. In some very long tubes a reheat is necessary to finish the forging.

In Fig. 1 a straight tube is being inserted into the dies on the press. The dies alternately open and close over the tube at a speed of about 11 to 28 ipm through a stroke of 3 in. The porter bar or manipulator feeds the tube through the die in increments of 4 to 6 in. while rotating or indexing the work slightly to assure uniform metal flow and concentricity.

Die pressures from 1000 to 2500 tons or more are usually necessary depending on tube size, length, shape or degree of taper. Near the finishing stage on long tubes it is sometimes necessary to exert 2500-ton pressure on the material because of the greater resistance of the tube as it approaches its final shape.

Fig. 2 shows the tube nearing completion of the forming process. The tube wall has thickened about 10 pct over its original dimension of 15/16 in. After forming tubes are laid aside to air cool Fig 3. The entire operation from the furnace and through the dies required about 6 minutes. These tapered rollers were later stress relieved before eventual machining and welding together to achieve the finished product shown in Fig. 4.

Definite improvement in physical properties is achieved and a fine grained or forged steel microstructure is developed together with freedom from surface defects. The 12.5 pct variation in wall thickness, common in commercial tube stock, is virtually removed by the thorough working of all the metal in the work.

The only subsequent working of the rollers to finish size included turning the outside diameter after pairs of tapered tubes are welded together at their small ends.

In one instance, to produce 206,729 lb of finished product just 348,242 lb of material was used. Had it been necessary to machine the rollers from the solid, approximately 1,600,000 lb of forged steel would have been required in addition to subsequent machining costs due to boring and the removal of excess stock.

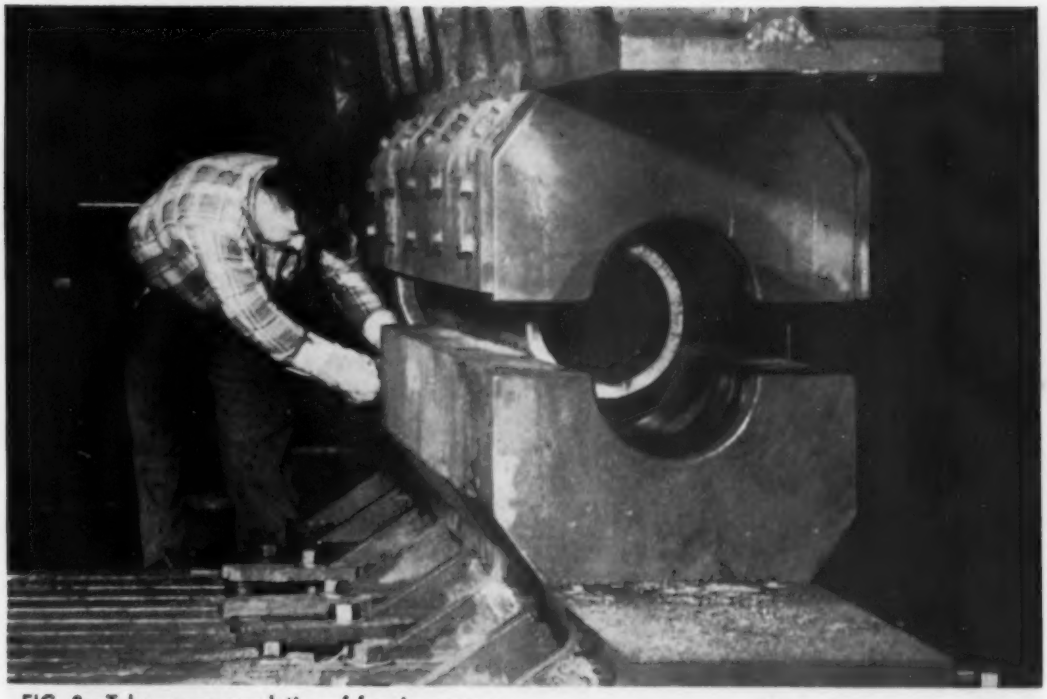


FIG. 2—Tube nears completion of forming process. Wall thickness increased about 10 pct.

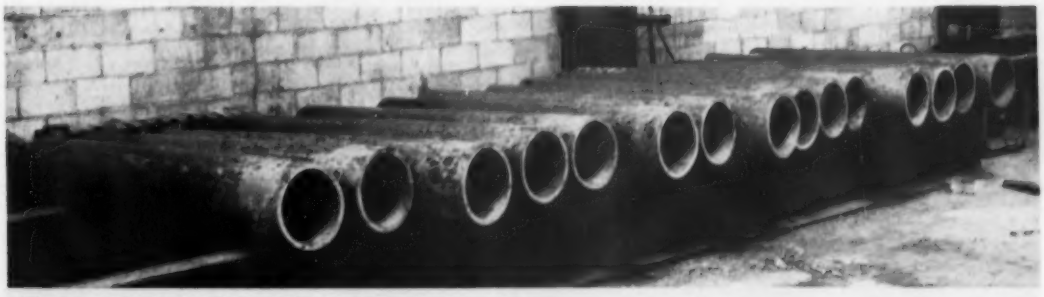


FIG. 3—Tapered tubing is laid aside to air cool. Forming operation takes about 6 min.

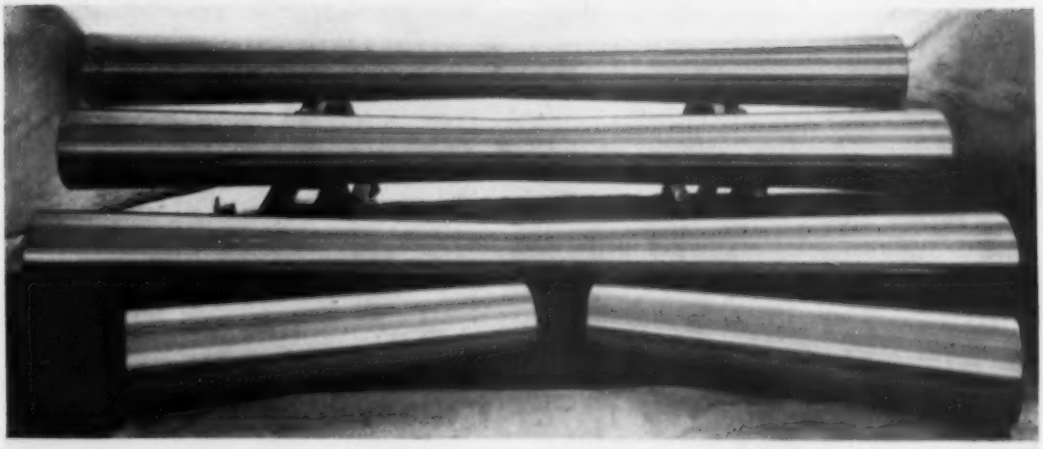


FIG. 4—After forming tube is stress relieved, machined and welded into final product above.

Easy to use—

Cold Cleaners Do Effective Job in Still and Spray Tanks

◆ Two new cold cleaners, used in combination, effectively remove shop oil and dirt without producing toxic or disagreeable fumes . . . One cleaner is an active surface agent . . . The other improves cleaning action and acts as a rust preventive.

◆ Dirt removal is by emulsification and preferential wetting . . . Rinsing after cleaning is not required . . . Any simple form of agitation helps cleaning action.

By JAMES McELGIN, Manager, Metal Working Dept., E. F. Houghton & Co., Philadelphia

◆ SUCCESSFUL results with cold cleaners for power washers over the past several years have created a demand for a room-temperature cleaner which could be used in still tanks. To meet this demand, E. F. Houghton & Co., Philadelphia, has perfected two compounds which have proved highly satisfactory in many diverse cleaning operations.

Many plants use dip or spray tanks with petroleum solvents to remove cutting oils, chips, shop dirt and smut from their parts in process. However, insurance companies and safety engineers are pointing up the hazards involved with the use of such tanks in a production line.

There is also a need, especially in small plants, for a cleaning method to replace hot alkaline solution cleaning with its attendant heating expense. In other cases, too, there is need for a room-temperature cleaner which, with adequate agitation, can remove ordinary processing oils and shop dirt.

The two room-temperature cleaners, Hougto-Clean Nos. 402 and 403, are used in combination to impart specific characteristics to the cold-cleaning solution. This combination would replace dip or spray tanks containing petroleum solvents. It would also be effective in most tank cleaning operations where hot alkaline cleaners are used except highly specialized operations such as electrolytic cleaning, paint removal and cleaning prior to vitreous enameling.

High detergent action

Use of this cleaning combination requires no heat, produces no toxic, disagreeable or flammable fumes. The cleaning solutions are non-irritating to the skin and protective clothing is not required.

These cleaners possess high detergent action for fast, efficient cleaning of metal parts. The No. 402 compound is a liquid surface active agent with a neutral pH. It produces a translucent solution. The No. 403 cleaner is a pow-

dered product added in small quantities to the No. 402 solution to control any tendency to foam or rust. It contains an active buffer, further improving the cleaning power.

To remove ordinary processing soil and shop dirt, the combination is used in the proportion of one pound of No. 402 compound and ½ to 2 ounces of the 403 per gal of water at room temperature. Easily removed soil requires less, while tenacious soil, such as heavy-duty cutting oils and drawing compounds, may require up to twice the amount.

The cleaning action is not identical to that of straight solvents. Using the combination, oil and dirt are removed by emulsification and preferential wetting of the surface of the metal by the solution.

No rinsing after cleaning

All that remains on the surface is a light protective film. Rinsing of the work is not required after cleaning. The film has good rust preventing characteristics, providing excellent protection between operations and is effective for short term indoor storage.

As soil is dissolved by solvent cleaners, it saturates the solution and reduces its effectiveness. With continued use, more and more of the dissolved material becomes deposited on the parts. In contrast, parts processed with the Houghto-Clean combination are clean and bright.

"Efficiency of still tank cleaning is greatly increased if the solution is agitated . . ."

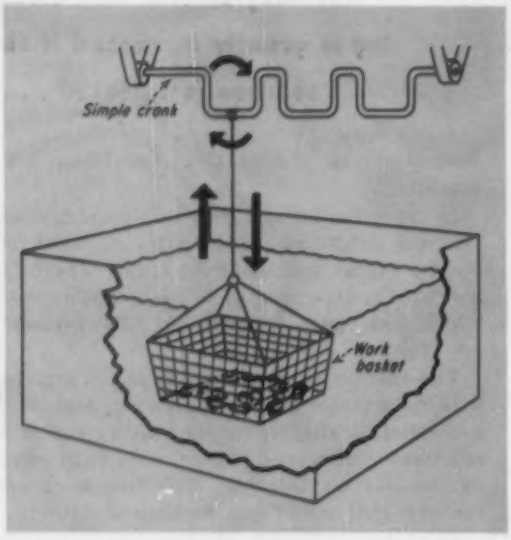
In replacing hot alkaline solutions, the cold cleaning combination eliminates objectionable steamy vapors and irritating spray. There are also appreciable savings in tank heating costs which may range from $25 to $100 per week per tank.

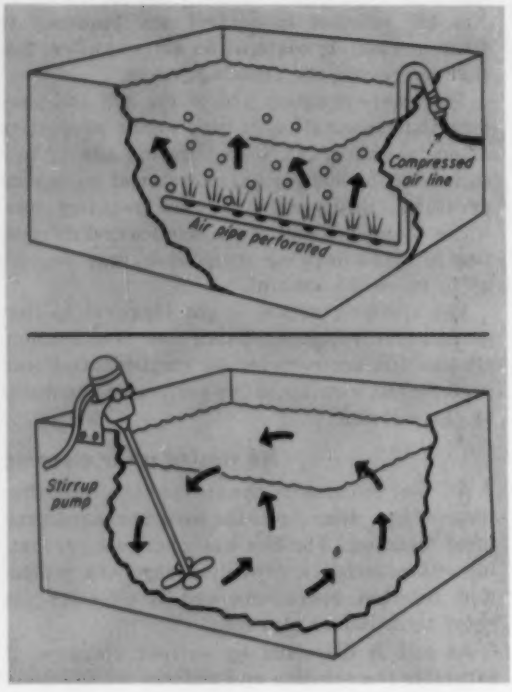
The different type of cleaning action involved with room-temperature cleaners will sometimes necessitate a slightly longer soaking period in still tanks. However, this is more than offset by the cleaner, brighter, stain-free work and the improved safety and working conditions.

Efficiency of still tank cleaning is greatly increased if the cleaning solution is agitated. Any form of circulation, low-pressure spray or hose-off facilities improves the rate of cleaning, especially where smuts or buffing compounds are to be removed.

Any of several simple, inexpensive methods of providing agitation or circulation of the solution can be used. Any action that keeps the

CAST IRON PARTS undergo cold cleaning after machining to remove cutting oil and chips. Cleaner prevents rusting between operations.





SIMPLE AGITATION greatly increases cleaning efficiency. These three methods are inexpensive, but effective, particularly when smuts or buffing compounds must be removed.

solution in motion helps carry the emulsified soil away from the surface of workpieces which have been cleaned.

Some of the most commonly used methods of providing agitation are: rapid movement of the work by a mechanical crank arrangement; a compressed airline across the bottom of the tank; submerged jets below the surface of the solution; and the use of propeller or paddle-type agitators.

Except where agitation is desirable, equipment requirements are greatly simplified over former cleaning practice. Since heating is unnecessary, the expense for electrical wiring and piping and the need for a source of steam are eliminated. Cold cleaners also save expense for covered tanks with automatic fire extinguishing equipment and do not require hooding to carry off steam vapors, noxious fumes or flammable volatilized solvents.

Operators need no protective clothing since the cold cleaners do not irritate the skin. The use of a low-temperature cleaner also eliminates any danger from scalding.

Use inexpensive tank

Any inexpensive sheet metal tank may be used for the solution. Many small plants even use open-head 55-gal grease drums filled to about three-fourths their capacity with the cold cleaning solution. If agitation is necessary, it can be obtained by simply immersing an air hose in the solution.

A large ordnance plant replaced solvent cleaning with the cold cleaning water solution and air agitation to remove heavy cutting oils prior to final inspection. Inspection of deeply recessed finished surfaces was facilitated because of the brighter and cleaner surfaces obtained. Because of the rust protection afforded, parts could remain for several days before applying the final rust preventive coating.

Aids sludge removal

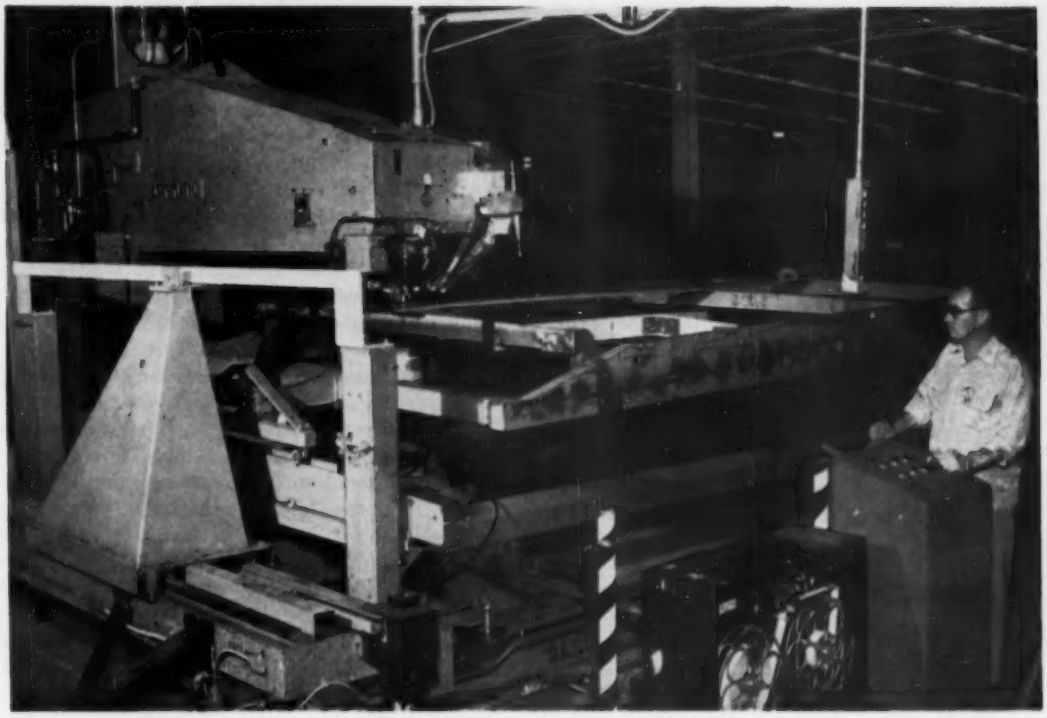
Rebuilders of used office machines and typewriters are removing the oxidized lubricating oil and dirt from these machines prior to disassembling by immersing the complete machine for a few minutes in the cold cleaning solution.

A large automotive spring plant sprays a heavy black lubricant on each spring leaf as it moves along an assembly line. Over-spray eventually coats the entire conveyor with the lubricant. Hand swabbing with cloths soaked in a 10-pct solution of Houghto-Clean No. 402 in water at room temperature quickly and effectively removes the heavy oil without creating a fire or health hazard.

Another large production plant uses 1 lb per gal of the No. 402 compound in water to remove sludge accumulations in piping of central coolant systems used with straight cutting oils.

An automotive parts manufacturing plant is using the cold cleaning combination for removing soot from gas carburized parts. This practice replaced tumbling in oleum spirits.

The solutions are also used with hose-off equipment, replacing mineral solvents for removing heavy straight cutting oils after gear cutting operations.



PUNCHED tape controls location of machine for drilling and riveting aircraft sections.

Tape Controlled Machines Do Fast Drilling, Milling and Riveting

◆ REELS OF PUNCHED plastic tape save valuable production time by controlling precision machine operations at Douglas Aircraft Co.'s El Segundo (Calif.) Div. Tiny "memory" holes in the tape ribbons actuate electronic impulses for repetitive drilling, milling and riveting on close-tolerance aircraft parts.

The firm uses three General Drivmatic tape-controlled riveting machines to help maintain production schedules.

One machine, working on stringers, drills and countersinks holes in these structural members. By tape impulse it also sets and heads rivets in the prepared holes.

As the tape unwinds, the machine's work-holding carriage moves in coordination with it. When a hole in the tape meets an electric eye beam it trips the electronic control system. A drill drops at the proper location to drill and countersink the hole, and then a rivet is dropped in and headed. The carriage automatically moves to the next location where the cycle is repeated. Rivets are fed singly from an overhead hopper.

The machine shown in the photograph handles oversize rivets for fastening heavy doublers. Headed to close tolerance, these rivets seal the fuel tank area of the Navy A4D-1 Skyhawk. Tape and machine control action are similar in sequence to the stringer drilling and riveting machine.

The third machine mills the wing skin, makes cutouts and drills holes for attaching access doors in top wing sections. Machine time for all these operations in one cycle is 6 hours. Without the tape-controlled machine, hand milling alone would have taken an estimated 200 manhrs.

The first manually-controlled run on a new part permits punching the blank tape to make a master control for repeat operations and cycle sequences.

Machine erection and setup is critical. It must be exactly level, and the rails on which the table operates under the riveting and drilling head must be in absolute parallel. If the machine is moved to a new location, new tapes must be punched for accurate control.

At one half mile—

Elevated Tank Designed To Withstand ATOMIC BLAST

◆ A newly designed 500,000 gal elevated tank can withstand an atomic blast equal to 20,000 tons of TNT at a ground zero distance of one-half mile . . . The new design uses a sphere, more and stronger columns, larger sway rods and heavier foundations to meet unusual pressure conditions and stay in service.

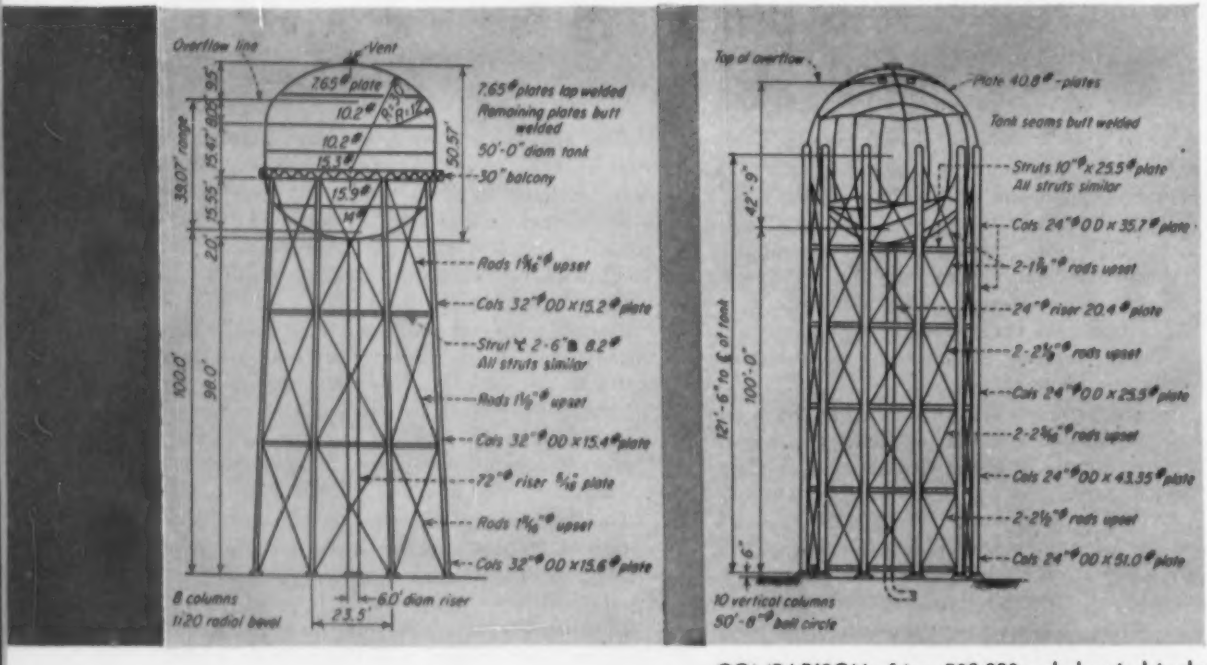
◆ ELEVATED TANKS AND STANDPIPES of average size and current design and construction would probably fail to remain in service closer than about 2½ miles from ground zero of a 20kt atomic blast (equal to 20,000 tons of TNT).

How to build tanks which would withstand such a blast at considerably closer distances was the problem recently handed the Pittsburgh-Des Moines Steel Co., Pittsburgh, by the United States Atomic Energy Commission. The result has been an improved tank design believed able to remain in service at a ground zero distance of approximately ½ mile.

Weakest member in tanks of current design appears to be the steel roof, usually an extended ellipsoidal-shaped portion of the tank shell and of integral welded construction. Such construction can resist external pressures of about 1 psi, approximately the peak overpressure from a 20kt bomb at 2½ miles from ground zero.

With construction of this type, collapse of the roof — coinciding approximately with arrival of the shock front—would probably cause collapse of that portion of the tank shell not filled with water. Part of the shell below this point would also probably collapse because of the tendency of creases to carry through the homogeneous welded construction.

Several constructions are suggested for removing the effects of this weakness of the tank roofs. With these changes, an elevated



COMPARISON of two 500,000 gal elevated tanks. Research studies were based on conventional double elliptical tank, left. New design, right, can withstand atomic blast ½ mile away.

tank of current design and construction would probably survive a 20kt atomic blast 1 mile away. The construction feature which then becomes of limiting strength is the resistance of the foundations in preventing overturning of the structure. While the foundations are probably the next weakest element, the diagonal wind rods are usually of about the same strength. If the foundations were better than usual, the rods would then limit the ground center distance to approximately 1 mile.

Foundations and sway rods could be considerably reinforced, as in the construction of elevated tanks to resist earthquake forces. The difference, however, would be small because all other elements of construction become critically weak at the peak overpressures and drag forces involved at ground center distances of about 1 mile from a 20kt atomic blast.

Maximum sway about 24 in.

In the case of the conventional double elliptical tank. the weakest part for resistance to blast effects is the shell plate at the top of the tank. In the case of the 500,000 gal tank, it would collapse at external pressure of 1.1 psi.

This would be the pressure at a ground zero distance of about 2½ miles, and assumes there would be no higher diffraction loading than this at the top. The critical distance, insofar as the roof is concerned, could probably be reduced to about 1½ miles by the addition of stiffening members inside the plates and by increasing the size of the roof vent. This would not be too difficult or expensive.

The addition of still more reinforcing to the roof and top ring of cylinder could reduce the critical distance to 1 mile, but considerable reinforcement would be required. The remainder of the tank would be stable if the water level were kept at the overflow line.

Maximum tank sway should be about 24 in. to avoid overstress of tower columns. Conventional tower design would allow the structure to sway this amount at about 3400 ft from ground zero. At this distance the peak overpressure is about 13 psi. It would be difficult and expensive to sufficiently reinforce tank plates from the balcony to the top to make the tank safe under this pressure. There is, therefore, little to be gained by reinforcing tower members so the tower may have a closer critical bomb distance.

Foundation column piers as usually built would probably be stable at about 3300 ft from ground zero.

Principal attention, therefore, in regard to the strengthening of existing structures to withstand blast effects should be given to stiffening of tank plates, particularly the thinner roof plates. This would enable these sections to better withstand the external overpressures and/or provide means by which the net external pressures may be reduced to safe values.

To properly determine what reinforcing is required, more data is needed than is now available regarding magnitude and distribution of reflected pressure on the tank as the shock wave passes over it in the diffraction stage.

Roof construction of standpipe and reservoir structures is again the limiting factor in blast resistance. But since construction of standpipe and reservoir roofs is often of different types, each roof must be studied separately.

Preliminary calculations indicate that in at least some average sizes of standpipe structures the shell would resist the blast forces at a ground center distance of about 1 mile from a 20kt blast. This assumes the standpipe were either filled with water or the interior of the standpipe were almost instantly accessible to the blast forces. To prevent the standpipe from overturning, provision would have to be made for absorption of shock energy either by yielding in the anchor bolts or by work done by tipping or sliding of the foundation.

An elevated tank of average size and height has been designed which, on the basis of available data, would remain in service at a ground zero distance of approximately ½ mile from a 20kt blast. The tank is spherical to better resist large external pressures. Tubular columns are of minimum diameter to reduce drag forces. Sway rods are of much greater cross-sectional area and foundations are much larger than the conventional designs for wind or earthquake resistance. Some members of the structure will be stressed into the plastic range with permanent deformation which absorbs much of the dynamic energy of the sway. This distortion is restrained sufficiently so the tank will remain in service after the blast has passed.

Water absorbs blast energy

If the tank should be empty or partially full at the time of the blast, the absence of a large mass of stored water would so reduce absorption of blast energy that the structure would overturn with a much shorter blast exposure.

Conclusions have been based on inadequate information as to the diffraction of pressure around the three-dimensional tank structures, and as to the exact magnitude and distribution of drag forces on the structures. The presently available information does not cover pressures at the high velocities and Reynolds numbers involved in bomb blasts. It is believed the assumptions made here are within plus or minus 50 pct of the correct intensity and distribution of the forces involved.

This article is based on a report published by the United States Atomic Energy Commission. Acknowledgment is made to: Mr. J. O. Jackson, Vice President, Engineering and Research; Mr. H. E. Lindberg, Chief Design Engineer, Pittsburgh-Des Moines Co., Pittsburgh; and to Prof. W. C. Alsmeyer, Iowa State College, for their work in preparing the report.

What to Consider When Buying ELECTRIC LIFT TRUCKS

Materials handling checklist—

◆ Specifying an electric lift truck for maximum efficiency and economy is often a problem . . . First rule for wise buying is this: Don't buy a special type for each handling job.

◆ Look for basic equipment that will do most of your work, use some other handling system for the remainder . . . Truck size, weight, battery capacity and other factors deserve careful study.

By W. A. MEDDICK, Vice President
Elwell-Parker Electric Co.
Cleveland

◆ BECAUSE OF SERVICE conditions, battery-powered industrial lift trucks are frequently specified for certain material handling jobs. But choosing the best type of electric truck involves many important considerations. The potential user should carefully weigh such factors as truck capacity, lift, size, and weight, also battery capacity, location of controls, and mechanical design.

General features

One basic rule applies to the economical purchase of any industrial truck: Specify one that

Handy fork lift truck has center sit-down controls, carries skid loads up to 4000 lb.

will meet average requirements. It is usually neither economical nor practical to buy a truck to cover every conceivable problem. For example, if loads occasionally must be tiered four-high although the majority are tiered only three-high, it is uneconomical to buy an extra-high-stacking truck for just the occasional job.

Or if 95 pct of a company's loads weigh 4000 lb, it is not practical to purchase a 6000-lb capacity truck for occasional heavier loads. It would be better to devise another method to handle this infrequent requirement.

It is wise to consider possible increases in future load sizes, as might happen when a handling system is modernized to operate at peak efficiency. But these requirements should not be anticipated so far in advance that the truck would operate for too long a time at nowhere near its potential capacity.

Certain handling attachments, obtainable with industrial trucks, can increase the volume of materials handled as well as the size of the loads carried. It is usually more economical and efficient to carry two 2000-lb loads simultaneously with a 4700-lb truck than to handle one 2000-lb load with a model of one ton capacity. It is more important to first plan the most efficient handling techniques, than to choose a truck to do the job required.

Lift factors

It is often advisable to stack loads to ceiling limits if (1) materials will support the weight of succeeding layers; (2) floors will take the strain of the total load; (3) trucks are stable enough for extra-high stacking.

Consider truck stability. If a truck wheel should drop into a slight hole in the floor, a load elevated 15 ft might move another foot laterally. This might tip the truck over. Likewise, if a package falls from a high load it can cause damage, injury or both. Also, truck uprights tend to twist when they are extra long, creating both physical and maintenance hazards.

Furthermore with telescoping fork trucks, a 2-in. increase in lift generally causes a 1-in. increase in the truck's collapsed height. If the lift is increased too much the truck might not pass through doorways or under low-hanging pipes or beams.

If a lift truck is used for loading rail cars or highway trucks, its collapsed height should permit entry into the carrier. Most truck manufacturers build a 68-in. high model for carrier loading. But unless a truck has full initial lift (where forks rise without increasing overall truck height) it may not be able to tier loads in such low headroom areas.

Increasing the height of a truck's lift beyond the standard may also prove expensive. There are several methods which permit high tiering without increasing collapsed truck height; the principal one uses triple telescoping uprights. Although workable, the system reduces truck capacity and is often very costly for that reason.

Versatile 3-ton capacity unit has special lift to lower work into a sub-floor quench tank.

Split ram on 8-ton capacity truck works hydraulically, handles one or two small coils.

Weight and size

One of the most important factors in determining total truck weight and size (mostly the former) is the floor loading capacity wherever the unit must operate. This applies not only to plant floors, but includes those in elevators, highway trucks, rail cars, etc. Tire loading vs. truck size is also important. The bigger the tires, the bigger the truck must be.

Floor load capacity must be computed in terms of a live load which is truck weight plus the heaviest load the truck will carry. Certain truck types are designed for use on weaker floors. They are either basically smaller or are built to distribute their weight over a greater area.

Where plant elevators are involved, some companies have skirted the floor loading problem by having load and truck ride separately. Others use smaller, lighter-weight vehicles just to load and unload elevators and even to ride with the loads. The heavier, faster trucks are confined to floor work.

Truck size may also be limited by the physical areas in which it must work. Narrow aisles

and confined production or storage areas limit a truck's overall size and capacity. All areas in which a truck will operate must be studied to find the safe, allowable size limit. Powered platform trucks may often be used where fork trucks cannot because their basic design distributes the overall weight more evenly.

Battery capacity

Capacity of an industrial truck battery must be sufficient for the vehicle to perform its duties properly throughout a normal working day. Figuring required battery capacity for a given truck requires a study of its usual daily activities. These would include length and frequency of trips, number and height of lifts, action of attachments, amount of "jockeying" motion, number of starts and stops and tilt action.

Since many users demand a smaller and more compact truck, the problem of equipping the unit with a suitable battery often arises. Even though certain truck design alterations will accommodate a larger battery, and certain new small battery features give greater output, the truck's size and battery capacity must still be compromised to insure maximum efficiency.

Operator location

Another important consideration is the location of the truck controls and operator's position. While the choice is somewhat limited in platform trucks and cranes, it is possible to specify these locations in fork trucks.

Basically there are three options: (1) center control sit-down; (2) center control stand-up; (3) end control stand-up.

There are advantages to the various operator locations, although it is often a matter of personal preference. Most standard fork trucks today, in capacities up to 10,000 lb, are the center control sit-down type. This is primarily for the operator's comfort. Since automobiles are also operated from a sitting position, operators are perhaps more easily trained for the job.

Many companies prefer to have the operator stand, either in the center or at the end of the truck. They feel that this keeps the operator more alert than when he is allowed to relax in a sitting position. Another reason is that operators can move on and off the trucks quickly and easily. Still other concerns feel that this stand-up position tends to tire the operator.

Some users prefer end control stand-up so that the operator has the entire truck in front of him and need not worry about the back half of the truck striking obstacles not within his immediate view. Other companies prefer center control so that the operator is closer to the loads he picks up and positions.

Mechanical features to be considered in specifying electric trucks include such components as the drive axle, trail axle, controls, steering chuck and lifting mechanism.

CHECKLIST for Industrial Truck Buyers

You'll find it worthwhile to go over this list with truck manufacturer's representatives. From wide experience they know the best truck features for your handling jobs.

Capacity

- ☐ Size and weight of loads most often handled
- ☐ Possible increased load size and weight

Lift

- ☐ Greatest stacking height feasible minus height of one complete load unit
- ☐ Allowable collapsed height of truck
- ☐ Maximum weight withstood by bottom load in the stack
- ☐ Maximum weight withstood by floor
- ☐ Maximum stability of truck during high stacking

Total Weight & Size

- ☐ Floor load capacities
- ☐ Elevator capacity and size
- ☐ Aisle widths
- ☐ Limitations of confined areas
- ☐ Floor capacities of commercial carriers

Battery Capacity

- ☐ Length and frequency of travel
- ☐ Lift requirements
- ☐ Tilt actions
- ☐ Action of attachments
- ☐ Whether ramps are travelled
- ☐ Amount truck "jockeying"
- ☐ Length of working shift per day
- ☐ Size of truck

Location of Operator and Controls

- ☐ Individual company operating conditions

Mechanical Features

- ☐ Individual preference and manufacturer's suggestions

Density ratios over 98 pct—

How To Produce Hard, Tough Steel Parts From Powder Metal

◆ Small, close tolerance, highly stressed steel parts are now being made with modern powder metallurgy techniques . . . High density ratios are a key factor in making parts with high mechanical properties.

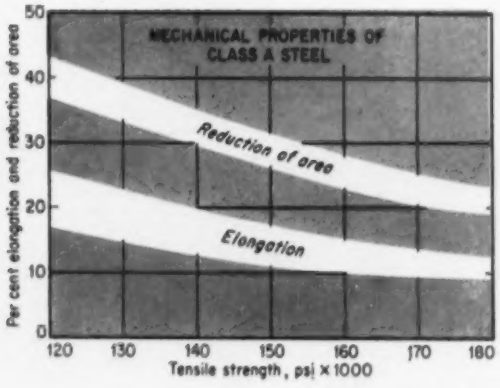
◆ Elongation, reduction in area and impact strength all show an abrupt improvement at a threshold density of about 97 pct . . . Density ratios above 98 pct are attained . . . Gas carburizing and close control of the mix put carbon where it is needed and in the quantity needed.

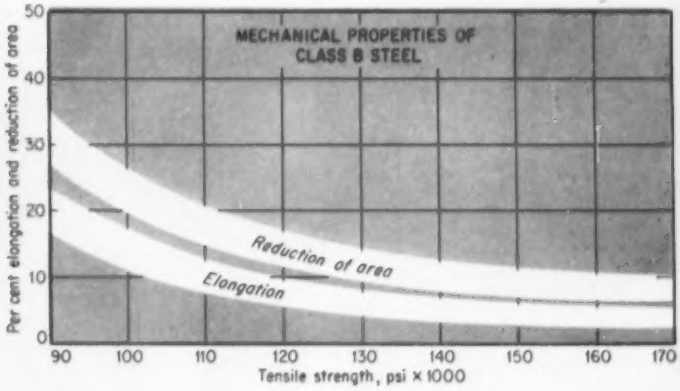
By J. W. YOUNG, Vice President
Isthmian Metals, Inc.
Boston

◆ STEEL PARTS from metal powders which are characterized by high density and a combination of hardness, strength and ductility approaching that of wrought material of the same alloy and carbon content are now being produced.

The mechanical properties attainable open up new fields for powder metallurgy products, particularly in the production of small, close tolerance, highly stressed parts. Isthmian Metals, Inc. of Boston developed the processes used in making parts described here and Comstock & Wescott, Inc., of Cambridge, Mass., were engineering consultants. Research resulting in the processes covered both hot and cold pressing.

Steel produced by these processes can be heat-treated like ordinary wrought steels to yield a range of hardness and tensile properties. The





Typical Mechanical Properties of Powder Pressed Materials

CLASS A STEEL*

Tensile Strength, psi	Elongation Pct	Reduction of Area, Pct	Rockwell Hardness	Minimum Density Ratio, Pct
156,000	13	27	C-35	98
137,000	17	35	B-100 (C-22)	98
110,000	22	45	B-95	98

* Approximating the composition of SAE 1060 steel.

CLASS B STEEL*

Tensile Strength, psi	Elongation Pct	Reduction of Area, Pct	Rockwell Hardness	Minimum Density Ratio, Pct
104,000	15	20	B-90	95.5
143,500	7	10	C-24	95.5
198,000	4	6	C-37	95.5

* Approximating the composition and properties of SAE 1080 steel.

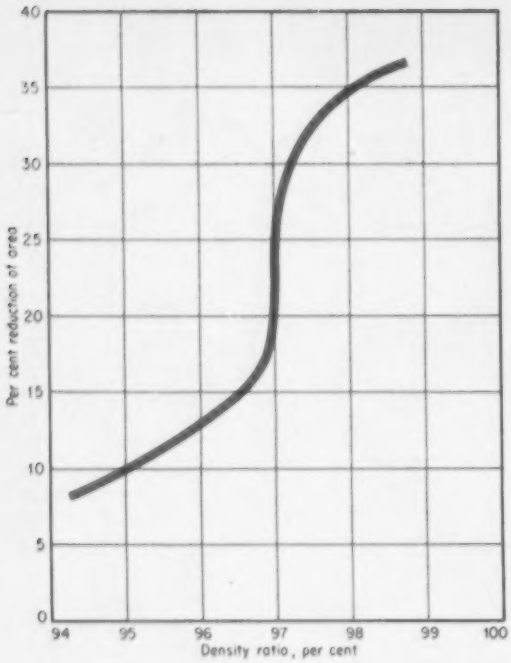


FIG. 3—Relation between per cent reduction in area (in tensile test) and density ratio.

range of mechanical properties which can be obtained with two classes of steel produced are shown in the Table and in Figs. 1 and 2.

One of the most important factors in attaining high mechanical properties was found to be a high density ratio (low porosity). Density ratios well above 98 pct of full density are readily obtainable. It was found that whereas tensile strength is roughly proportional to the density ratio, other properties such as elongation and reduction in area and impact strength show an abrupt improvement at a "threshold" density ratio of about 97 pct. Fig. 3 shows the relation between density ratio and the per cent reduction of area measured tensile test specimens.

Compressed in two stages

To obtain the necessary high-density ratio, suitable powders are compressed cold in two stages with an intermediate sintering. While some carbon may be introduced in the original powder mixture, if the steel is to contain a high carbon content most of the carbon is introduced by gas carburizing after the final pressing operation. After the carbon has been added, the piece may be heat-treated, case hardened, or electroplated by conventional methods to secure desired surface, hardness, mechanical properties.

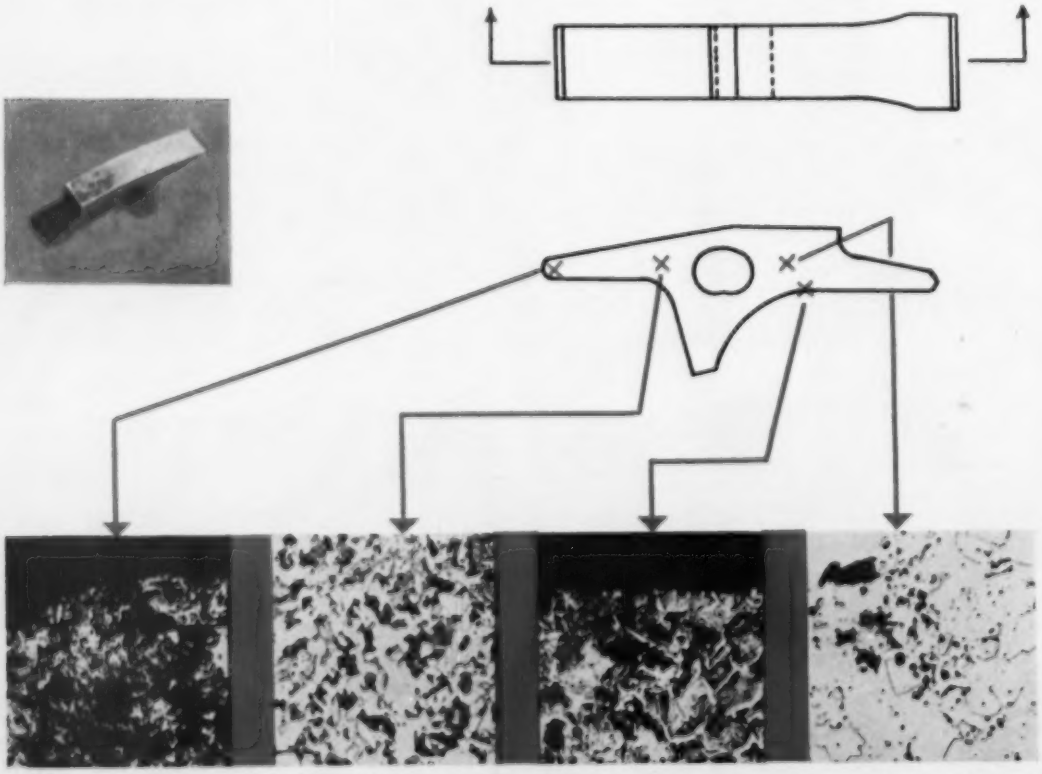


FIG. 4—Photomicrographs emphasize structural differences in areas of gun sear. X100

Specifications for the gun sear, Fig. 4, required very close dimensional tolerances, good physical properties and a hardness of Rc 48 to Rc 53.

In particular the dimension between the two parallel surfaces at the bottom of the part was required to be held to 0.030± 0.001 in. This had been found a difficult dimension to hold through the heat-treating for pieces made by conventional machining because of the non-symmetry of the piece. This dimension was maintained in the powder metallurgy process.

The operations employed resulted in parts having a surface hardness of Rc 48 toRc 53 and a final density ratio in the range of 98.4 pct or better. Carbon content approximately 0.8 pct at the surface and 0.1 pct in sections most distant from the surface. The microstructure was that typical of good wrought steel. Sears made by the Isthmian process were tested under actual firing conditions in a rifle for 20,000 rounds without failure or detectable wear. Estimated life expectancy of the weapon is 4500 rounds.

The bayonet butt plate, Fig. 5, is costly to fabricate by conventional machining methods because of the rectangular hole, the T-shaped slot, and the elliptical contour. Under conventional manufacture this part has been machined from bar stock and from steel forgings, hardened and tempered to Rc 33 to Rc 38. These requirements indicated that the Class A steel would be well-suited for this part.

The operations used produced parts of a hardness of Rc 33 to Rc 38 and a density ratio 98 pct or better. Parts successfully passed simulated service tests in all cases. The parts were also tested by inserting a T-shaped bar in the T-slot and another bar in the rectangular hole, and applying tensile stress until the parts ruptured at the T-slot. Parts showed 50 pct higher strength than pieces made from steel forgings due to the fact that the powder pressing had smoother and more perfectly formed fillets in corners of the T-slot.

In obtaining the high density ratio necessary for superior mechanical properties the iron powder used should be annealed soft, contain not over 0.3 to 0.5 pct of non-iron ingredients (other than carbon, which should not be over 0.25 pct) and undissolved inclusions not over 1 pct by volume. Annealed electrolytic iron powder can fulfill these requirements.

To secure good heat-treating properties in the final part, a small percentage of ferro-manganese powder is introduced in the initial mixture. To avoid oxidation of the manganese during sintering with oxygen and the water present in powder compacts either chemically or absorbed by the iron, powdered graphite is included in the powder mixture. If oxidized, the manganese remains undissolved and has a harmful effect.

In making Class A steel the carbon content of the core of the compacts is reduced to about 0.1 pct during sintering which leaves the compacts soft enough to be repressed easily to density ratios of over 97 pct at pressures of

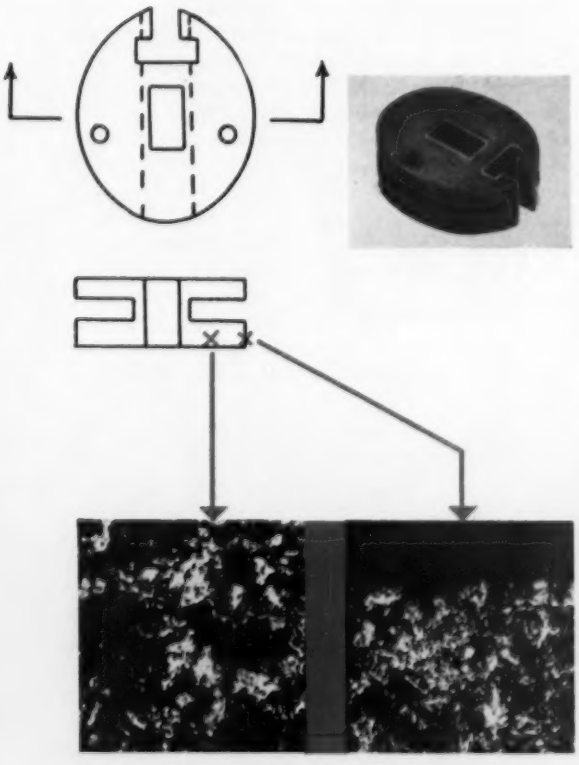
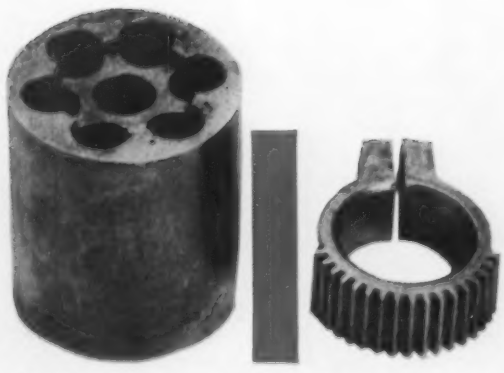


FIG. 5—Powder metallurgy methods simplified production of hard-to-make butt plate. X100

Patents issued to Isthmian Metals, Inc. covering principal features of processes described here include: 2,489,838, 2,411,073, 2,554,723, 2,489,839, 2,495,823, and 2,540,457. Plans are being made to license manufacturers to use these processes.



OTHER PARTS produced by these processes include this revolver cylinder and a gear segment.

How Two High Density Powder Metal Parts Were Made

GUN SEAR

Powder Mix:	Annealed electrolytic iron powder (—50 mesh) blended with ½ pct stearic acid, 0.05 pct carbon, and 0.63 pct ferromanganese.
Briquetting:	Approximately 27 tsi pressure.
First Sinter:	2 hr at 2000°F in cracked ammonia atmosphere.
Lubrication:	Thin soap film.
Coining:	72 tsi pressure.
Carburizing and Equalizing:	8 hr at 1850°F, in cracked ammonia-methane atmosphere in equilibrium with 0.8 pct carbon.
Machining:	Conical shaped hole and semicircular shape around hole machined.
Quenching:	In oil, from 1500°F.
Tempering:	575°F to 600°F.

BUTT PLATE

Powder Mix:	Annealed electrolytic iron powder (—100 mesh) blended with 1 pct stearic acid and 0.9 pct ferromanganese.
Briquetting:	33 tsi pressure.
First Sinter:	3 hr at 2000°F in dry hydrogen.
Lubrication:	Thin film of stearic acid.
Coining:	100 tsi pressure.
Anneal:	1 hr at 1000°F in dry hydrogen.
Machining:	Mill side slots, drill hole, broach tips.
Carburizing:	8 hr at 1700°F in hydrogen-propane mixture.
Equalizing:	14 hr at 1700°F in hydrogen-methane mixture.
Quench:	In oil, from 1550°F.
Temper:	½ hr at 900°F to 925°F.

60 to 80 tsi. Where more carbon is desired in the core, particularly with larger pieces, extra carbon is used in the original powder mixture. Since more carbon in the iron increases its hardness, such pieces cannot then be repressed to as high a final density ratio and hence do not have as good mechanical properties as Class A steel. Carbon to about 0.6 pct can be left in the core of the compacts after sintering. Steel made this way, Class B steel, is particularly useful in making larger parts for which through-carburizing would take too long a time.

The carbon remaining in the core of the briquets can be adjusted to have any desired value from about 0.1 to 0.6 pct by regulating the amount of carbon used in the powder mixture. Carbon can also be introduced by gas carburizing after the repressing operation, all the way through in the case of small pieces, or as a case of predetermined carbon content for both small and larger pieces.

A strong wear-resistant surface

In most cases parts need not be carburized long enough to produce a uniform carbon content throughout, since most parts require the hardness, wear resistance, and strength imparted by high carbon content only near their outside surfaces. One of the most useful modifications of the process is that in which enough carbon is used in the original powder mix to produce a tough low-carbon core, and after the second pressing, a relatively thin high-carbon case obtained by any conventional carburizing method is hardened to produce a hard, strong, wear-resistant surface.

In obtaining the necessary high density ratio, pressures used in the two pressing operations should be within certain critical ranges. Pressure used in the first pressing operation should never be over 40 tsi. Pressures higher than this tend to weaken rather than strengthen the final piece. Pressure used in the final pressing must be at least 60 tsi to produce the required critical density ratio.

In the second pressing operation, friction between the compact and the die walls must be minimized to obtain a high density ratio. Before the second pressing the briquets contain a high percentage of interconnected porosity. If a penetrating lubricant were applied, its presence in the pores would prevent their being closed during the repressing and the high density ratio could not be obtained.

Isthmian has developed a method of applying a film of solid lubricant to the surface of the briquets in such a way that it does not penetrate the pores to an objectionable degree. A lubricant such as white soap is dissolved in water and used to coat a quantity of pellets of the type which are used in barrel burnishing. After coating with a solution, the pellets are dried, leaving them coated with a thin film of dry soap. The briquets to be lubricated are then tumbled with the coated pellets and given a thin uniform coating of the lubricant.

After repressing, additional carbon is introduced into the pieces by gas-carburizing. In the case of Class A steel substantially the entire final carbon content of the piece is introduced at this stage. With Class B steel the core may already contain all its carbon and additionl carbon may be introduced only to provide a high carbon case.

No special die making problems are involved. For most parts, separate die and punch sets are required for first and second pressing operations. While some steel dies may be used for briquetting, carbide inserts are preferred for long runs. Carbide die cavity inserts, on second pressing dies, show no wear or abrasion over long runs.

Even though an unusually high density ratio is achieved in the second pressing, it is not necessary to build dies to closer than normal die tolerances. A unique system enables both dies of a set to be made to ordinary diemaking tolerances and yet achieve full density in all regions of the compact.

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New Technical Literature:

Catalogues and Bulletins

Gap presses

Minster Series G1 gap presses are covered in this literature. Standard features are described. The presses are shown and their advantages are discussed. Complete specifications are included. *Minster Machine Co.*

For free copy circle No. 1 on postcard, p. 129.

Sponge rubber

ARco-CEL closed-cell sponge rubber material is covered in this new brochure. The sponge rubber is composed of individually sealed cells containing inert nitrogen. Applications in the automotive, aircraft, appliance, air conditioning and sports equipment manufacturing fields are shown. Specifications on the various types of material and chemical resistance data are included. *Automotive Rubber Co., Inc.*

For free copy circle No. 2 on postcard, p. 129.

Tubing and pipe

Stainless tubing and pipe is covered in this new catalog. Eleven types of fabrication are described. The fabricating characteristics of ferritic, austenitic and certain specialty steels are given. Tables provide detailed information of cold bending and coiling both tubing and pipe. *Alloy Tube Div., Carpenter Steel Co.*

For free copy circle No. 3 on postcard, p. 129.

FOR YOUR COPY

Money-saving products and services are described in the literature briefed here. For your copy just circle the number on the free postcard, page 129.

Luminous ceilings

Luminous ceilings in lighting are covered in this new brochure. The brochure tells the story of the use of luminous ceilings in lighting offices, stores, industrial areas, drafting rooms, financial institutions and schools. Some of the topics discussed are cost control, modernization, maintenance costs and design possibilities. The advantages are covered. Specifications are included. *Luminous Ceilings Inc.*

For free copy circle No. 4 on postcard, p. 129.

Crane

How a hot and fume-enveloped crane in a steel forging plant was kept in continuous service by air conditioning the cab is described in this new case report. Installation is discussed. The conditioning unit is shown and described. *Dravo Corp.*

For free copy circle No. 5 on postcard, p. 129.

Wire straightening

Wire straightening and cutting machines are the topic of this new bulletin. Typical models are shown. A handy chart is included for selection of the proper machine. Information is given on wire cut lengths and speed in feet per minute of both stationary cut-off and flying shear type machines. Models described handle round, square, hexagonal and special shapes. *Lewis Machine Co.*

For free copy circle No. 6 on postcard, p. 129.

Straddle carriers

A trend in the field of materials handling, the use of straddle carriers, is the topic of this new bulletin. The advantages of the carriers are discussed. Examples of plants using the carriers are given. Applications are described and shown. *Industrial Truck Div., Clark Equipment Co.*

For free co y circle No. 7 on postcard, p. 129.

Copper

The latest copper and copper-alloy specifications are contained in this reference manual. Included in this manual are ASTM, ASME, AWS, SAE, AMS, Federal, Military, Army, Navy and Joint Army-Navy specifications. *American Brass Co.*

For free copy circle No. 8 on postcard, p. 129.

Stainless valves

Seventy-five questions and answers about the selection and maintenance of stainless steel valves are contained in this technical paper. The article covers selection of materials, data on new materials, service and installation problems, as well as information on valve repair. *Copper Alloy Foundry Corp.*

For free copy circle No. 9 on postcard, p. 129.

Low pressure cylinders

Low pressure cylinders, 650 psi maximum, are reported on in this new catalog. The cylinders are described and their advantages are pointed out. Features are discussed and shown. Specifications are included. *Hopak Div., Gallan-Henning Mfg. Co.*

For free copy circle No. 10 on postcard, p. 129.

Furnaces

"Continuous Type Circ-air" recirculating furnaces are covered in this new bulletin. Diagrams show construction features. A table gives temperature and time in furnace. Contamination from products of combustion is eliminated, according to the bulletin. Other advantages are covered. *Industrial Heating Equipment Co.*

For free copy circle No. 11 on postcard, p. 129.

Turn Page

FREE TECHNICAL LITERATURE

Rayotube detectors

The L&N line of Rayotube temperature detectors is covered in this new data sheet. The sheet covers use of these radiation type detectors for either direct sighting applications to measure the temperature of stationary or moving surfaces or for sighting into closed-end target tubes to measure the temperature of a furnace atmosphere or other medium. Specifications are given. *Leeds & Northrup Co.*

For free copy circle No. 12 on postcard, p. 129.

Comparator

The new "target" duplex shadowgraph comparator is covered in this booklet. Among applications listed are next to machines, on the production or assembly line, inspection department, and tool room. Among advantages are lower costs, faster production, and elimination of production and inspection errors. Accessory equipment is listed. Specifications are included. *Portman Instrument Co., Inc.*

For free copy circle No. 13 on postcard, p. 129.

Silicones

The part silicones play in industry's increasing emphasis on product improvement and production economy is emphasized in this new catalog. Data on various silicone products and the organic materials they displace are given. The products are indexed by application. Many tables, graphs and pictures are contained. *Dow Corning Corp.*

For free copy circle No. 14 on postcard, p. 129.

Overdoors

Barber-Colman Overdoors are covered in this new Overdoor Guide. The uses of these doors and other equipment for industrial, commercial and residential applications are discussed. Methods of preparing building openings and space required for the installation of the doors are given in drawings and charts for all models. Featured is a section on Weather-King door construction. A new operator for swinging pedestrian doors is shown, the Model Y. *Barber-Colman Co.*

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FREE TECHNICAL LITERATURE

Aluminum fasteners

Alcoa aluminum fasteners and screw machine products are described in this new booklet. Included in the booklet are bolts, screws, binding posts, rivets, washers, knobs, nails, and license plate fasteners. Special products that can be made up to customer specifications are also shown. Among advantages listed are strength, light weight and conform to all standard specifications. *Aluminum Co. of America.*

For free copy circle No. 16 on postcard, p. 129.

Heat treated heads

Heat treated threading heads are the topic of this new booklet. Among advantages listed are wide range, set-up ease, trouble free operation, ease of adjustment, sturdy construction, versatility of application and tangential chasers. Design features are pointed out. Special head attachments are covered. Complete dimensions and specifications are included. *Landis Machine Co.*

For free copy circle No. 17 on postcard, p. 129.

Welding metals

The Arcos Corp. full line of filler metals for welding is shown in this new chart. Each rod and electrode is identified by the metal for which it is suited, forms available and methods with which it is used. All products are listed by their brand names. Recommended welding methods are given. Among methods covered are metal arc, submerged arc, metallic electrode, oxyacetylene and atomic hydrogen. *Arcos Corp.*

For free copy circle No. 18 on postcard, p. 129.

Sanborn "150"

The Sanborn "150" Series oscillographic recording systems and components are covered in this new folder. It contains illustrations, technical data and specifications on two- and four-channel systems, plug-in preamplifiers, single-channel recorder, four-channel system for use with analog computers, and individual portable cases for recorders and amplifier-power supply units. *Sanborn Co., Industrial Div.*

For free copy circle No. 19 on postcard, p. 129.

FREE TECHNICAL LITERATURE

These publications describe money-saving equipment and services . . . they are free with no obligation . . . just circle the number and mail the postcard.

This section starts on page 124

Lift trucks

"How to Operate a Lift Truck" is the title of this booklet, now in its sixth printing. The booklet is designed for easy reading and is packed with information about the operation of a lift truck, preventive maintenance, safety and basic materials handling. *Hyster Co.*

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Grinding wheel

Grind-O-Flex, the new flexible grinding wheel, is covered in this new folder. The grinding wheel is for deburring, light grinding, finishing and polishing on irregular surfaces. The wheel is shown and its features are discussed. *Merit Products, Inc.*

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Milling, grinding

The New England Machine & Tool Co. template and cam machine model 104 is the subject of this new folder. This machine is for milling or grinding external and internal contours. Among advantages listed are the fact that the machine works directly from a drawing, takes less time, and greater accuracy. Features of the machine include noncontacting tracer control, wide range of spindle speeds, wide range of reduction ratios, manual feed, spindle head vertical adjustment and plug-in electronic unit. Complete specifications are included in tables. *Pratt & Whitney, Div., Niles-Bement-Pond Co.*

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Spray pickling

A comprehensive discussion of continuous spray pickling is contained in this illustrated booklet. In the process, high pressure sprays blast the conveyorized work from all angles to provide fast, uniform results and reduce hydrogen embrittlement to a minimum, according to the booklet. Special chapters deal with pickling of drawn parts and preparation of steel for porcelain enameling. *Metalwash Machinery Corp.*

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Electrical precipitation

Electrical precipitation equipment is covered in this new bulletin. The bulletin describes the general principles of electrical precipitation, the individual sections are devoted to its chief applications, including blast furnaces, ferro-manganese furnaces, cupolas, openhearth furnaces and miscellaneous metallurgical uses. Installation photographs and diagrams supplement the text. *Research-Cottrell, Inc.*

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Steel fabricator

This new bulletin describes the Mubea line of steel fabricators, including all types of single and multi-purpose machines for shearing, slitting, punching, bar cutting, mitering, coping and notching operations. *Alwin Fr. Wilkens, Inc.*

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Control switch

The Proctor infinite control switch is described in this new bulletin. Complete operating details of the control device are given. The bulletin also includes specific recommendations on how the device may be used to develop new design features in small industrial laboratory furnaces, kilns, hot-plates, as well as in household appliances such as griddles and electric ranges. Complete specifications are included. *Equipment Div., Proctor Electric Co.*

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Tester

The "Color-Glance" Brinell hardness tester is shown and described in this new catalog sheet. The three colored lights of the machine indicate the relative hardness of the parts being tested on a production basis. The features of the tester which make possible high speed production testing and automatic operation when required are described. *Steel City Testing Machines, Inc.*

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Hoists

Spur-gear hoists are described in this new booklet. In addition to standard single and multiple-chain units, models for specialized applications are shown. Among these are Army type, low head-room, clevis-connected and extended handwheel hoists. Various types of trolleys, both plain and geared, are also included. Pictures, drawings, descriptions and specifications are given. *Coffing Hoist Co.*

For free copy circle No. 28 on postcard.

DDS

Dihydroxy diphenyl sulfone, or DDS, is covered in this new technical bulletin. This chemical shows promise as an ingredient in the production of heat-resistant epoxy and phenolic resins, according to the bulletin. DDS has been primarily used as a bath addition agent in the electroplating field. Several DDS reactions are diagrammed in the bulletin. *Monsanto Chemical Co.*

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FOR MORE LITERATURE
Many companies offer free literature and other information in their advertisements. For the names of these firms see the company listings in the index of advertisers.

Fasteners

Stainless steel fasteners are reported on in this new catalog. Bolts, screws and rivets are among products covered. The products are shown and their advantages pointed out. Tables and graphs give additional information. Complete specifications are included. *Allmetal Screw Products Co., Inc.*

For free copy circle No. 30 on postcard.

Metal cutting tools

The Viking Tool Co. line of modern metal cutting tools is described and illustrated in this new catalog. Among tools included are milling cutters, blades, locks, screws, single point tools with mechanical chip breakers, special single point tools, sharpening fixtures and methods, and chip breakers. Complete specifications are included. *Viking Tool Co.*

For free copy circle No. 31 on postcard.

Durco

Durco corrosion resisting alloys and equipment are covered in this new catalog. Alloys, their characteristics and availability, are given. Among equipment covered are pumps, valves, pipe and fittings, and miscellaneous equipment. Complete specifications are given. *Duriron Co., Inc.*

For free copy circle No. 32 on postcard.

Parts

Motor parts for portable tools are reported on in this booklet. Performance data, ratings and dimensions are all given. Complete specifications are included. *Robbins & Myers, Inc.*

For free copy circle No. 33 on postcard.

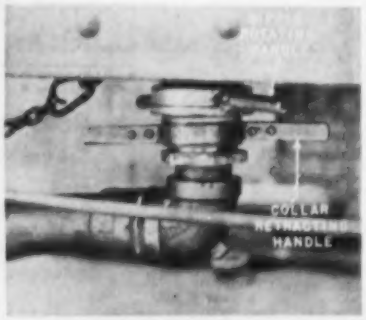
UNLOADING: Empty Cars Faster

An improved coupling has helped speed the unloading of oil tank cars of the Homestead Works of U.S. Steel Corp. . . . Hose to tank connections now made in a few minutes.

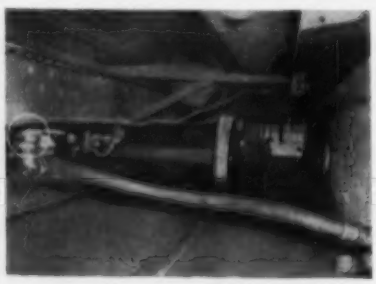
The Homestead District of U. S. Steel Corp has cut down labor and increased safety in its tank car unloading operations. Responsible for this is a unique hose coupling made by Titeflex, Inc., Springfield, Mass.

Lubrication oil is delivered by running the tank car alongside the maintenance stores building and unloading the car into storage tanks in the basement of the building. This required connecting a flexible hose from the discharge fitting on the underside of the car to the inlet fitting in the wall of the building.

Originally, standard practice was followed in tank car unloading—that is, connecting the flexible hose to the tank car by a threaded coupling. This required the use of a large wrench in the restricted space below the tank car. Hence, coupling was a laborious job that often took two men half an hour. Also, the design of the threaded coupling required that it be screwed on extremely tight to prevent oil leakage.



New tank coupling . . .



Gives rapid seal . . .

WANT MORE DATA?

You may secure additional information on any item briefed in this section by using the reply card on page 129. Just indicate the page on which it appears. Be sure to note exactly the information wanted.

Coupling Time Reduced

By replacing the threaded coupling with a rapid sealing coupling, the time for this hose-to-tank car connection was reduced from half an hour to a few minutes. But even more important, safety was increased because the new coupling eliminated leakage at the connection.

When the nipple is inserted in the coupling and the collar released, the nipple end of the coupling sits solidly against the seal ring. The coupling becomes sealed the instant the coupling is fully closed. When fluid pressure is in the line, the seal ring's lips are expanded and pushed against the facing ends of the coupling. This makes the seal tighter as pressure inside the line increases.

Collar arrangement in this coupling permits a full swiveling action. Neither end of the coupling has to be twisted to connect or disconnect the coupling. One man can engage or disengage the coupling. Furthermore, the absence of twisting prevents kinking of the hose.

Because most tank cars are equipped with permanent threaded

discharge fittings, the Homestead Works uses a threaded fast seal coupling nipple that can be screwed onto this fitting without using a wrench. This can be done by one man, whereas the threaded coupling required two.

The Quick Seal coupling body, attached to the flexible discharge line by an elbow fitting, has handles attached to the collar so that it can be easily retracted. This permits slipping the coupling body over the nipple—an operation that takes only seconds and can be done by one man. The coupling collar is then released, locking the coupling ends together and completing a leak-proof connection.

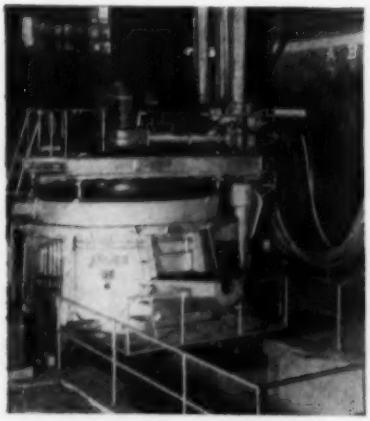
Casting:

Electric furnace aids foundry expansion.

To permit expansion into the alloy steel casting field, Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa., has installed a new $300,000 electric arc swing-type furnace.

Birdsboro, which until now has produced primarily carbon castings, plans to turn out an increasing volume of alloy steel castings in many analyses.

The new furnace, part of the company's current program of modernization and expansion, will help reduce operating costs and meet competition. Capacity of the furnace is 20 tons per heat, or approximately 125 tons per day. The shell is 11 ft in diam.



New furnace installed . . .

Pipe:

Aluminum pipe cuts costs in oilwell rig time.

Aluminum pipe is now being installed for temporary oil, gas and water lines and similar uses in the oil industry. Field tests show that the lines make possible sizeable savings in rig time, transportation and handling of pipe, laying and picking up lines, and other cost factors.

The new development is based upon the use of seamless, extruded aluminum pipe, weighing less than one-eighth as much as steel pipe of comparable dimensions, with a special quick coupling.

The aluminum pipe is available from Associated Oil Field Rentals of Houston, Texas.

Uses Split "O" Ring

Reynolds Metals furnishes the seamless, extruded pipe to Race & Race, Winterhaven, Fla., who add their own coupling devices and sell the pipe to firms such as Associated Rentals.

The coupling contains a split "O"-ring gasket on the inside, which seals when the coupling is latched in place.

In actual installations 2⅞ in. aluminum pipe, used because it is a standard size, has been installed and picked up about 10 times as fast as steel pipe of comparable dimensions. A mile of the aluminum pipe was recently handled by three men and one truck. Average stringing and coupling time was 1½ hr, and average un-

Saves time in field . . .

coupling and loading time was also 1½ hr. Total man hours were nine hours, and total truck time three hours.

Average Time 6 Hours

Engineers have estimated that to lay and pick up one mile of steel pipe of comparable dimensions on a temporary line, an average of 98 man hours would be required. Truck time would be about six hours.

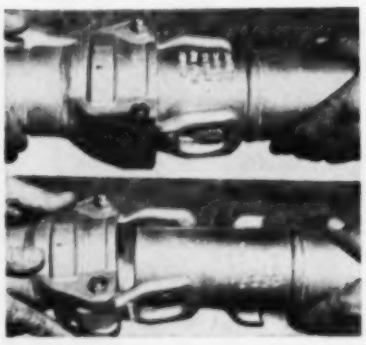
Savings with the aluminum pipe were found to result principally from lighter weight and speed in coupling and uncoupling. A 30-ft joint of the aluminum pipe weighs about 30 lb. Thirty feet of steel pipe of comparable dimensions would weigh more than 200 lb.

Other significant advantages of the new temporary aluminum lines include rig time saved, a greatly increased volume of fluid, fast coupling with no thread maintenance, and lower hauling cost.

Save to $500 In Rig Time

As much as $500 in rig time has been saved on some jobs because of the speed with which the temporary aluminum lines can be laid. The pipe handles about four times as much fluid volume because of the smoothness of the inside aluminum walls which greatly reduces friction loss. Savings are even more evident where installations must be made over difficult terrain and in inaccessible areas.

Associated Rentals is stocking the aluminum pipe in large quantities in their field yards over the Southwest, and will sell the pipe or rent it installed in place.



Connects quickly . . .

Joining:

Dovetail, bonding simplify aluminum frame structure.

A new approach to production of large aluminum forms such as frame members and bridging supports is helping to cut the cost of these structures and widen the field for their application in many industrial applications.

Heart of the new aluminum quarter-casting and quarter forming method is a dovetail type anchoring joint plus the use of a high strength bonding metal designed for bonding aluminum to aluminum or aluminum to other metals.

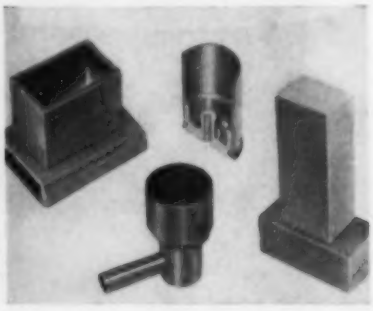
Strength Boosted 200 Pct

Strengthwise, the joining or bonding areas are designed to contain 200 pct joining or bonding area, by virtue of the dovetail anchoring and bonding surfaces. The bonding area surface contains 100 pct greater area, and therefore 100 pct greater tensile and shear strength.

The highest temperature bonding metal, having a tensile strength of 40,000 to 45,000 psi, and the linear area of the dovetail surfaces having 200 pct of the actual cross area, makes possible bonding strengths of 80,000 to 90,000 psi, it is claimed.

Applied to Small Assemblies

This method of bonding aluminum, or aluminum to other metals may also be used in making subminiature components such as may be found in the household and electronic fields.



Other assemblies . . .

The bonding metal absorbs the aluminum surface oxides during the application period, creating an affinement of the surface oxides with the bonding metal. This absorption and affinement is the result of mechanical action, such as stroking the bar of bonding metal back and forth across the bonding area.

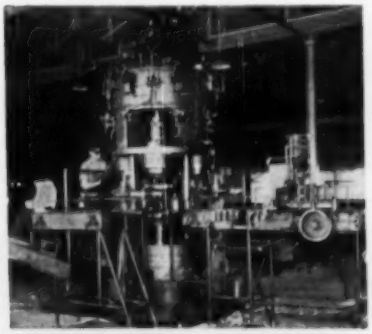
Each Application Different

This mechanical action may also be obtained by using a high-frequency or ultra-high-frequency electronic apparatus designed for this special use.

Each bonding application, however, has its own problem, such as size, type, design, number of units per minute or hour, etc. The application of the bonding metal may be so controlled as to increase the bond resistance to destruction by heat by increasing the resistance to remelt.

In Several Forms

The aluminum surface oxide, being of greater heat resistance, increases the remelt temperature of the bonding metal in direct proportion to the percentage of the aluminum surface oxide absorbed, hence a very light film of bonding metal will have a greater percentage of the absorbed aluminum surface oxides, than is the case with a heavy film.



MECHANIC CHECKS swaging machine at new Jones & Laughlin Steel Corp. combination warehouse-container plant, Lancaster, Pa. The machine can curl and bead the lips of 5 gal and 3½ gal steel shipping pails at high production rates.

Handling:

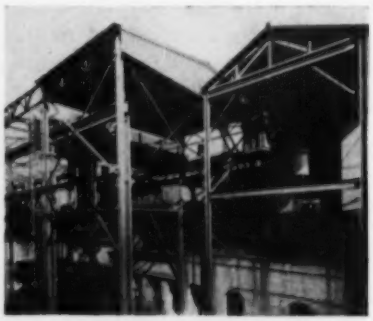
Modern devices simplify foundry charging operation.

Careful planning for a compact, skillful engineering system provides a fast, smooth flow of scrap, coke, and stone in the Cooper-Bessemer Corp. Foundry, Mount Vernon, Ohio.

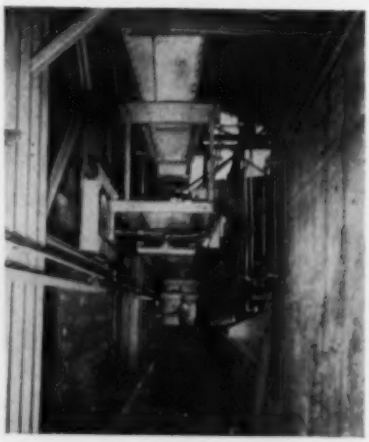
Only three men per shift are required for make-up and charging, because of mechanization and the efficient arrangement of storage bins, weighing, make-up and charging equipment.

One man operates a Whiting crane which loads the storage bins, using either an electrically operated bucket or a magnet.

Charges are made up and weighed in batch hoppers, and discharged into full cone-bottom charging buckets. A Trambeam monorail charger moves the charging bucket into cupola.



Preparing charge . . .



Foundry transfer car . . .

Tooling:

Phenolic resins cut costs for spinning, forming tools.

A new laminated die stock made with phenolic resins produces economical metal spinning chucks and other forms for shaping ductile nonferrous metals, plastics, wood, and similar materials.

Paper Base Laminate

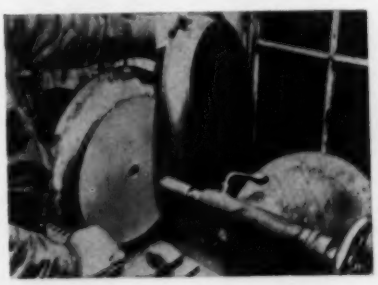
Developed by The Formica Co., this paper-base laminate impregnated with Bakelite phenolic resins is strong, easy to machine, and low in cost. It has an extremely slick, smooth surface and is eight times stronger than hard maple in dent resistance, according to the manufacturer.

Other Applications

These qualities also suit the new material for use in pattern boards, gluing jigs, stretch forms and hydropress forms, for example. At Maryland Metal Spinning Co., Baltimore, chucks formed of the new die stock are employed to form to unusually close metal spinning tolerances the housing for a delicate, precision-made weather instrument.

Spinning Brass, Steel

Brass 0.040 in. thick is spun to a tolerance of minus zero, plus 0.007 in. on a diameter of 3.409 in. On the inside, overall dimensions and tolerances run plus 0.005 in., minus zero. A chuck 2¾ in. thick, 29¼ in. in outside overall diameter, is used to spin a 17 gage cold-rolled steel ventilating ring with an inside flange 19½ in. in diameter for naval vessels.



Phenolics for spinning . . .

Grinding:

Reciprocating feed cuts sheet grinding time.

A reciprocating sheet feeder used in the grinding of alloy steel sheets for aircraft propeller blade manufacture has cut costs and increased production 50 pct. The Hamilton Standard Div. of United Aircraft Corp., Windsor Locks Conn., uses a set of reversing pinch rolls actuated by a photo cell to grind both with and against the grain for 50 pct faster removal of stock.

The shell, or exterior part of a steel propeller blade, is made from flat, cold-rolled alloy steel sheet 110 in. long and 54 in. wide. Because of balance, sheets must be of a specified thickness.

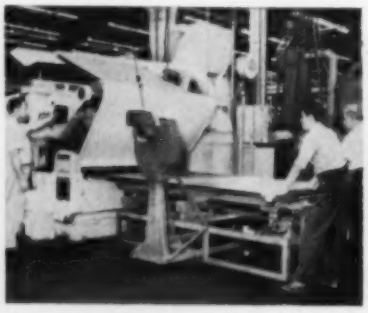
Since the sheets, as received from the steel mill, vary as much as .006 in. in thickness, it is necessary to remove the excess stock. This is done on a wide belt sheet grinding machine.

Grind Off 0.002 in. of Stock

The average sheet weighs approximately 65½ lb and requires the removal of 0.002 in. of stock. A 60-grit belt coated with aluminum oxide abrasive is used for roughing off the stock, the average sheet requiring 20 passes.

This was formerly done by the "pinch roll" or through-feed method. The sheet was put in one end, taken out the other end and moved around the machine to its original starting point. This procedure required each sheet to be handled 40 times.

This method was both slow and costly and a method of stock re-



Grinding time cut . . .

moval was developed which solved both problems by reducing cost and increasing production.

Photo Cell Reverses Rolls

A photo cell was installed over the machine's weight-checking table and a microflex counter mounted on the machine. A sheet is placed on the table, and the number of passes necessary to grind the sheet to size is determined.

The counter is then set for the required number of passes and the sheet is started into the pinch rolls. The photo cell reverses the pinch rolls after each pass, and when the counter has completed the cycle for which it was set, the sheet is automatically ejected onto the checking table.

Grind With and Against Grain

Since the sheet is started and finished at the same end of the machine, the personnel necessary for the operation was reduced 50 pct.

In using this reciprocating pinch roll method, the sheet is ground both with and against the direction of travel of the abrasive belt.

The amount of stock removed per pass was almost 50 pct greater than with the pinch roll through-feed method in which the grinding is done with the "grain" of the belt. Since each sheet now requires only half as many passes as formerly, an increase of nearly 50 per cent in production is obtained.

Testing:

Develop large wind tunnel to test porcelain panels.

Before production could begin on a recent large order of porcelain enamel architectural panels, the Ingram Richardson Mfg. Co. of Beaver Falls, Pa., set up an unusual wind tunnel to test panels.

The Beaver Falls firm was awarded a contract for the production and erection of 90,000 sq ft of architectural porcelain enamel for the exterior facing of the new Ford Central Staff Office Building

in Dearborn. This is believed to be one of the largest uses of porcelain enamel ever made in a single structure.

Full Scale Mockup

A full scale mockup of a section of the 12-story, multi-million dollar building was erected in Flat Rock, Mich., by Moynahan Bronze Co., the architectural aluminum contractor.

Measuring 30 ft wide by 30 ft high, the mockup included 18 insulated porcelain enamel panels, architectural aluminum framing and six panels of plate glass.

To test the water tightness of the wall assembly, a "wind tunnel" with an airplane engine was brought into place before the mockup. The engine was operated to produce winds of 90 miles per hour and thousands of gallons of water were introduced into the airstream to simulate a severe rainstorm. All components of the wall assembly passed the test.

Good Insulating Properties

The dark green porcelain enamel panels being produced are only 2⅝ in. thick, but they have the insulating properties equivalent to 18 in. of masonry construction. Standard panel sizes are about 4 ft 6½ in. x 3 ft 9½ in.

The panels consist of a front face of porcelain enamel on 16 gage steel, laminated to ¼ in. honeycomb aluminum; a 24 gage galvanized intermediate sheet and a 2 in. layer of Foamblas insulation contained within a 20 gage galvanized back pan. The panel is sealed around all edges.

Testing porcelain enamel . .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Socket screw users who want *what* they want *when* they want it know it pays to specify B-RIGHT-ON! Brighton Socket Screw Products *always* measure up.
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Melting:

New small vacuum furnace designed for flexibility.

A new vacuum melting and casting furnace suitable for production of high-purity metals or for experimental and pilot-scale work has been developed by F. J. Stokes Machine Co., Philadelphia.

The new furnace can melt up to 50 lb of steel or other metals.

It is equipped with a tilting crucible and turntable for semi-continuous casting and can be fitted for bottom pouring.

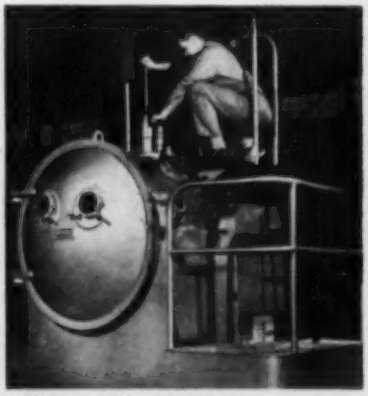
Has Two Sight Glasses

The furnace chamber is a horizontal cylinder 4 ft in diam and 4 ft long. A full-opening hinged door, "O"-ring sealed, gives complete access for charging, maintenance, or installation of additional equipment.

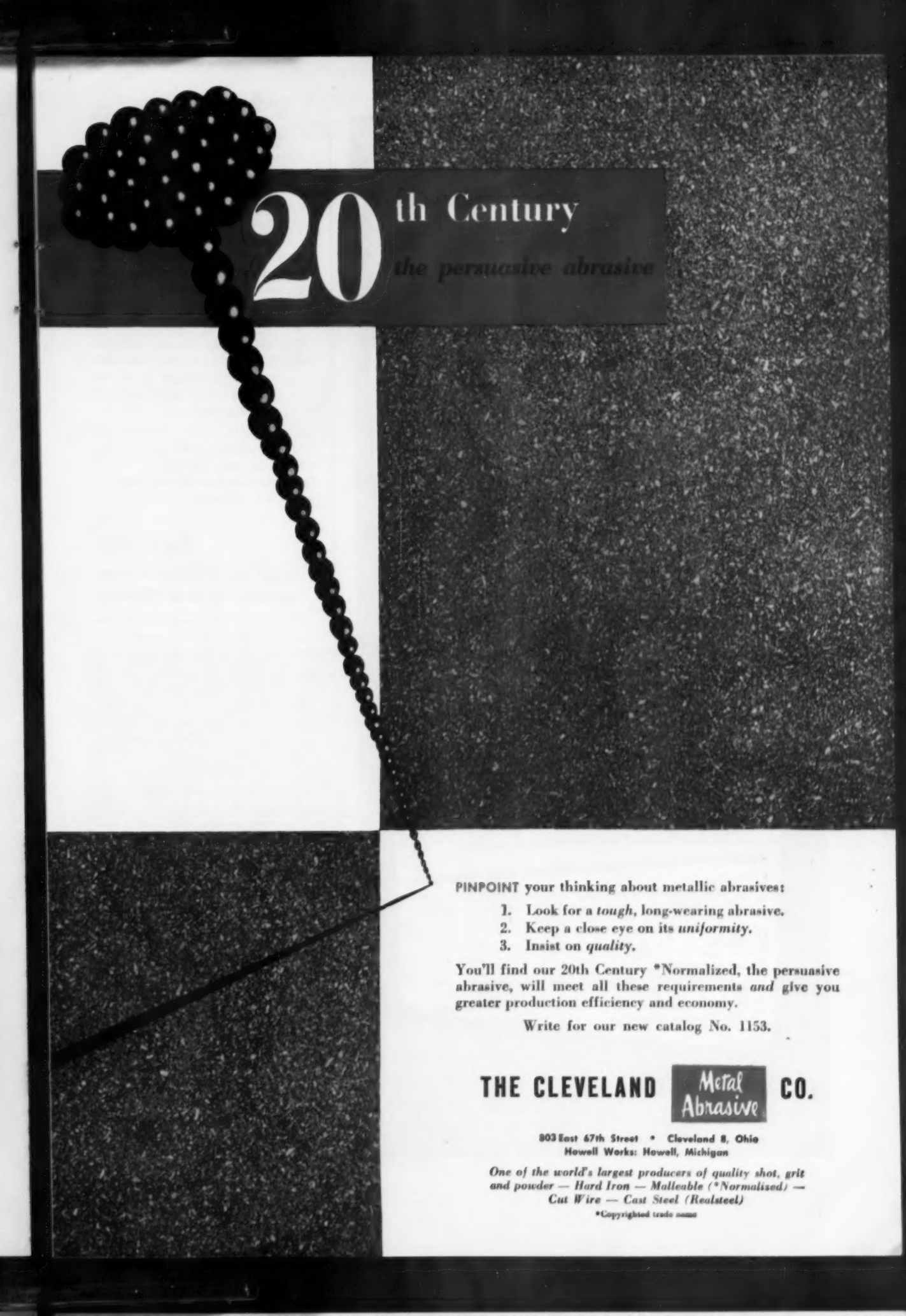
The entire chamber, including the door, is water-jacketed. Two sight-glasses in the chamber side walls permit to observe progress of melting and casting operations.

A 3 in. vacuum lock in the chamber and, above the crucible, contains the bucket which holds the materials to be added during melting. Samples can be taken, and temperatures measured by thermocouples without breaking vacuum.

Handling operations inside the chamber are all actuated mechanically from outside the chamber. Optical pyrometer readings of the condition of the melt are taken through a sight-tube in the top of the chamber.



Pilot scale furnace . . .



PINPOINT your thinking about metallic abrasives:

1. Look for a *tough*, long-wearing abrasive.
2. Keep a close eye on its *uniformity*.
3. Insist on *quality*.

You'll find our 20th Century *Normalized, the persuasive abrasive, will meet all these requirements *and* give you greater production efficiency and economy.

Write for our new catalog No. 1153.

THE CLEVELAND Metal Abrasive CO.

803 East 67th Street • Cleveland 8, Ohio
Howell Works: Howell, Michigan

*One of the world's largest producers of quality shot, grit and powder — Hard Iron — Malleable (*Normalized) — Cut Wire — Cast Steel (Realsteel)*

*Copyrighted trade name

The new Stokes furnaces are also used for vacuum sintering. A sintering area 6 in. in diameter by 10 in. high is provided. The vacuum pumping system uses a new design of a Stokes booster pump, backed up by Stokes mechanical pumps. Two pumping systems meet different requirements and both have ample capacity to assure rapid evacuation of the chamber.

Coaxial power leads, entering through the side of the chamber, will carry a maximum of 50 kw, either of high-frequency or low-frequency current.

The remote control panel conveniently groups push buttons for operations and indicating lights show the exact condition prevailing in the vacuum system.

Safety:

Crane cab conditioning keeps operators at peak efficiency.

To provide maximum safety for crane operators in the openhearth and soaking pit departments, Lone Star Steel Co. equipped its six cranes with air conditioners.

Five of the Lone Star, Tex., firm's cranes are equipped with Dravo Corp. Model C-5H self-contained conditioners. Mounted on the crane cabs, they discharge cool, clean air through ceiling diffusers. This equipment not only filters the air to remove dust, dirt, odor and fumes, it also cools the cab in summer, heats it in winter.

Comfortable working tempera-

Air conditioned cab . . .

tures of 78°F to 80°F are maintained in summer by the 5 hp capacity cooling unit. Powerful blowers circulate 600 cfm of air, one-quarter of which is fresh make-up for ventilation. Electric strip heaters installed in the air stream maintain a comfortable cab temperature of 68°F to 72°F in winter.

Since space was limited on one crane cab it was equipped with a split type conditioner. Here, the evaporator or cooling section of the unit was placed inside the cab and connected to the condensing section outside by the refrigerant piping.

Productivity Boosted

All six units have the same capacity and are complete with compressor and motor, condenser air fan, condensing coil, evaporator coil and fan, conditioned air fan and motor, dirt and odor removal filters and electric strip heaters.

As a result of these precautionary measures, crane operators perform their duties under conditions which promote efficiency, alertness, productivity and safety.

Design:

Ultrasonic equipment finds new industry uses.

A new line of ultrasonic equipment has been developed for use in quality control, manufacturing, and industrial and scientific research by the Curtiss-Wright Corp. Three of the newly designed units are for manufacturing and experimental work and two are intended for quality control.

In the manufacturing field the new ultrasonic products are the Diatron drill, a parts washing unit and an ultrasonic generator adaptable to many types of laboratory work.

Cuts Holes to Any Shape

The Diatron ultrasonic drill can, without rotating movement, cut holes of any shape, no matter how intricate, in a variety of materials, including steel, glass, ceramics, carbide and other hard materials.

In addition to its ability to handle irregular profiles, the drill leaves a surface that needs little or no finishing and is of an accuracy to fit most close-tolerance requirements.

The drill uses an abrasive suspending in a liquid and distributed over the cutting soundhead in a thin film. Ultrasonic vibrations of 25,000 cps resulted from the unit's transducer.

Cleans Delicate Parts

The parts washing device separates grime from large or small pieces in a fraction of the time required by conventional methods. The system works well with delicate jewel bearings, ball bearings and gears.

Parts to be cleaned are inserted in a container for exposure to ultrasonic vibrations. Vibrations shake loose the grime and dirt so that it falls to the container bottom and is carried away by a circulating solvent. Vibrations have no effect on the part being cleaned.

Different Heads Used

The Curtiss-Wright Laboratory unit is based on an ultrasonic generator with different sound heads for treating different products. Such a device is useful for working out new solution techniques or formulas.

For quality control the company offers the Echoscope and the Sonometer. Both permit non-destructive testing.

The Sonometer acts as a "seeing eye" in the instant detection of internal flaws in metals, glass, rubber, concrete and other solids. It accurately registers the location of these hidden defects. It can be used with a variety of parts ranging from fine wires to giant forgings.

Monitors By Impulse-Echo

Consisting of a transmitter and a transmitting and receiving soundhead, the Sonometer dispatches sound vibrations through the solid. Any defects are automatically revealed by a reduction in the ultrasonic volume transmitted to the receiver.

In this fashion a Sonometer can

with TOCCO* Induction Welding

Here's the story of how one company, a large manufacturer of automotive equipment and farm implements, is using TOCCO Induction Heating to increase production and effect substantial savings at the same time.

Production Increased

When TOCCO Induction Heating replaced oxy-acetylene, output of these hollow "track roller shafts" went up from 220 to 300 pieces per 8 hour shift. The heating cycle with TOCCO is only 55 seconds as opposed to 90 seconds formerly required with gas. Result: much lower labor cost per unit.

Fuel Savings

Fuel costs nosedived from $10.50 per hundred pieces to only $1.95—about $25 per shift saved on fuel costs alone. Other important savings have resulted from a substantial reduction in down time and maintenance costs. Quality of the weld is more uniform with Induction, and hazards of explosion present with former method are eliminated.

If the manufacture of your product involves welding, heat treating, forging, brazing or the melting of ferrous or non-ferrous metals, don't overlook TOCCO as a sound method of increasing production, improving product quality and slashing costs.

THE OHIO CRANKSHAFT COMPANY

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control quality of sheet and strip, wire, plate welds, soldered contacts, fabricated parts and the like. It can also check the adhesion of plated or veneer surfaces.

The Echoscope, another "seeing eye" device, works on the reflective or impulse-echo method in monitoring material quality. This unit uses only one soundhead, which also serves as a receiver.

In the Echoscope ultrasonic impulses are reflected by hidden flaws and transmitted to a visual cathode ray tube which accurately indicates the position and depth of the defect.

The Echoscope's mobile soundhead can be used to spot internal cracks in cast and forged pipes and parts, axles, bridge structures, boiler walls, parts under heavy stresses, pressure tanks and bottles, ceramic high-voltage insulators and slabs and blanks.

Rolling:

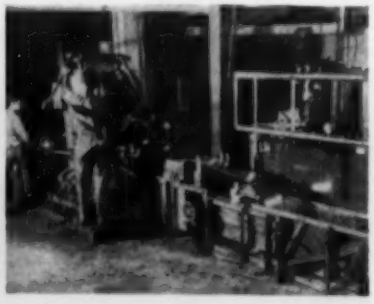
Improved coolant system boosts metal quality.

An unusual oil coolant and lubricant system on four-high rolling mill at Eastern Brass & Copper Co., New York City is helping to improve surface conditions and general quality of aluminum finish.

Made by Browser Chemical Co., the system consits of two units.

A main dirt filter removes foreign particles capable of scratching metal surfaces. A double oxide filter removes oxides tending to "gray" aluminum and dull down brass and copper surfaces. The system uses a special rolling oil, stored in a 350 gal tank under the filters.

The oil lubricant permits a



Oil improves rolling . . .

closer tolerance control as well. Increased demand for tolerances and surface finishes which cannot be obtained through regular mill channels led Eastern to install the set-up.

Addition of the new oil system is part of Eastern's expansion of its aluminum storage and processing facilities to meet recent manufacturing developments in the use of the metal.

Research:

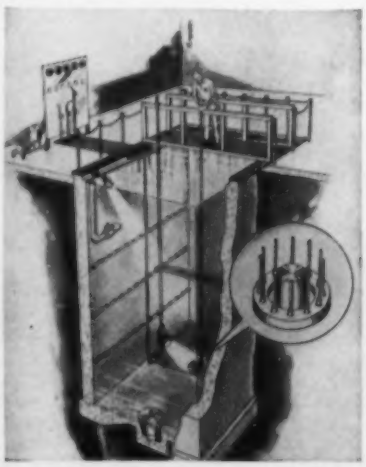
Effects of radiation on electronic units to be studied

One of the country's largest gamma-radiation sources will study radiation effects on electronic components, lubricants, and engineering construction materials. Results of such studies could help develop more radiation-resistant materials for tomorrow's nuclear-powered air, sea, and land craft.

Installation is being made at Battelle Memorial Institute, Columbus, Ohio. Initially, the source will consist of 2000 curies of cobalt-60, which is equivalent in radioactivity to $24 million worth of radium. Housing for the installation has a planned capacity for 10,000 curies of cobalt-60.

Available to Industry

Completely owned by Battelle, the initial 2000 curie source will be generally available to industry for contract studies.



Research reactor . . .

The new facility also offers tremendous opportunities to improve on existing materials-processing techniques and to make products that are impossible with present-day technology.

"Trigger" Chemical Reactions

For example, recent studies show that a gamma radiation source may be particularly useful in activating or "triggering" chemical reactions that are vital to the development of better synthetic chemicals, rubber materials, and new plastics.

The cobalt-60 source is also expected to play an important role in furthering progress on the radiation sterilization of certain foods, drugs, and medical supplies which are difficult, too costly, or impossible to sterilize by conventional methods.

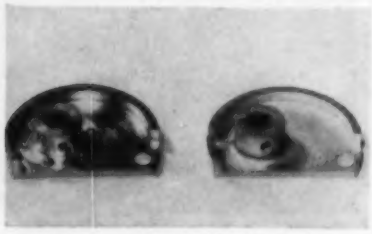
Methods:

Investment casting cuts production costs on cam.

Converting a two-part valve cam assembly operation to a single investment casting cut production cost on this item about 86 pct. This saving has been realized by the Stratos Division, Fairchild Engine & Airplane Corporation, New York. Main cam segment in the original two-piece assembly was of 4140 steel turned from bar stock and hardened to Rc 50. Its hub was hard brass turned from bar stock and broached. To complete the assembly, the two pieces were riveted.

Cast In One Piece

Most of the costs involved in the production of this part came from the required machining operations plus the assembly of the two pieces. To eliminate these operations, the valve cam is now investment cast by National Precision



Investment cast cam . . .

Casting Corp., Clifton Heights, Pa. The part is cast in one piece including the hub, in 4140 steel; the cam area surface is hardened to Rc 50.

The new casting eliminates both the previously required shaping operations and the riveting operation.

Finishing:

Process improves corrosion resistance, paint adherence.

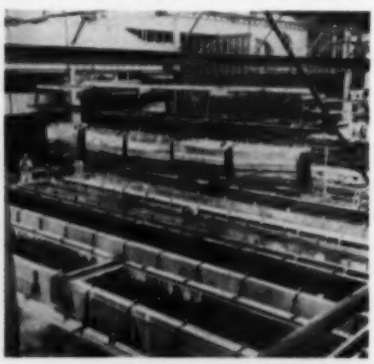
Three years experience with special corrosion-inhibiting chemicals for Lockheed Aircraft parts and components have more than paid off in lower maintenance costs for the big planes produced at this plant.

At the Lockheed-Marietta plant where B-47 Stratojets and C-130A cargo airplanes are being manufactured, Alodine corrosion-inhibiting chemicals made by American Chemical Paint Co. play an important role in chemically treating detailed parts for corrosion resistance and paint adhesion, to protect such highly stressed parts from weathering and corrosion.

Huge Processing Area

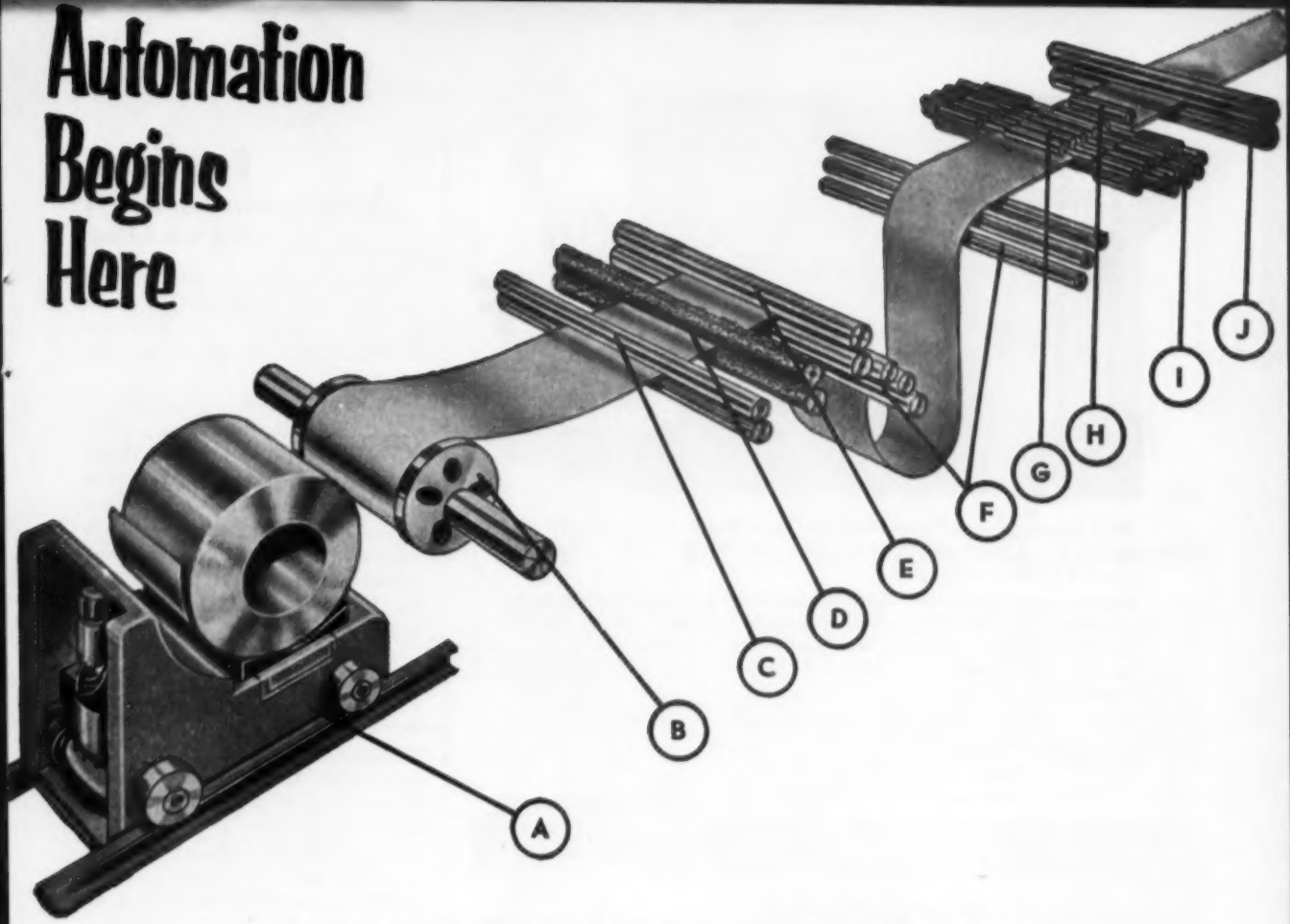
A huge processing area has been set up in which all types of chemical treatments for protection are carried on. Tanks are 40 ft in length, 4 ft wide and 7 ft deep.

The Alodizing process, with which 50 pct of all parts are treated, has been in use for three years, and maintenance of solutions and results of the process have been very satisfactory.



Protects aircraft parts . . .

Automation Begins Here



Automation—the automatic handling of work in process — permits manufacturers to combat high labor and material costs by boosting man-hour production. McKay has played a large part in this movement by designing and building "automated" equipment for the automotive and steel fabricating industries.

For example, coil feed lines of the type illustrated above were designed and built by McKay for several leading automotive firms. They are used to automatically feed coil stock into square shears or blanking presses, thus eliminating inefficient and laborious methods of manually feeding these machines.

TYPICAL LINE EQUIPMENT

(A) Hydraulic Loading Car for stand-by coil.

(B) Cone Type Coil Holder handles wide range of coil I.D.'s and O.D.'s.

(C) Guide Rolls to direct strip into brush rolls.

(D) Brush Rolls with solvent sprays to clean strip.

(E) Driven Pinch Rolls for pulling coil stock and filling storage loop.

(F) Guide Rolls to support loop.

(G, I, J & H) Feeder unit consisting of Backed-Up Leveler **(G-I)** and pinch rolls **(J)** is powered by D.C. drive which is controlled by a measuring device driven from measuring rolls **(H)**. The feeder flattens the strip and accurately measures it into open press dies or through shear knives.

Line operation is synchronized with the press or shear for maximum production. McKay builds these units with design, speed, and capacity dictated by your job requirements.

The McKAY MACHINE Company
YOUNGSTOWN, OHIO

McK

ENGINEERS AND DESIGNERS OF EQUIPMENT FOR THE AUTOMOTIVE, FABRICATING AND STEEL INDUSTRIES

Testing:

Nondestructive test assures leakproof tubing.

Invisible waves of electric current are used to detect the tiniest of flaws in welded steel pressure tubing at one of the large steel mills.

Any slight lateral movement of these waves, as they race around the circumference of the tubing, betrays the presence of a defect to a series of small electronic detector coils. This nondestructive testing method, called the Farrowtest process, is now in use at plants of the Republic Steel Corp.'s Steel and Tubes Div.

Acts Instantaneously

The coils, depending on the sensitivity and adjustment of the Farrowtest control circuit, can stop instantly the passage through the machine of the length of tubing when a flaw is detected. It will also sound an alarm, turn on a signal light or place tell-tale identifying marks on the tubing as it is inspected.

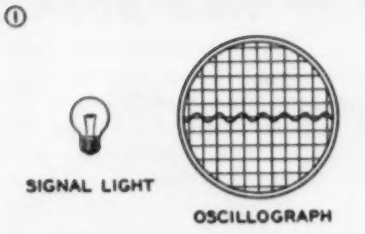
With some modifications in the basic circuits, the unit has been made adaptable for locating defects either in basic flat-rolled steel from which tubing is made or in the welding process.

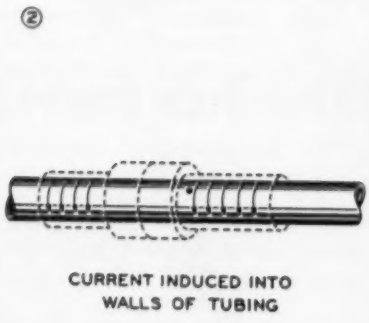
One of the unit's major applications is in testing tubing for automobile drive shafts. Other uses include testing of refrigeration tubing and ammunition components.

How It Works

Tubing is passed through a coil, which is linked to such warning controls as a signal light and an oscillograph. As it enters the coil, electric current is induced to flow through its walls.

The waves of current swerve to either side whenever they come to a defect and then resume their path. This sideward movement, however slight, is spotted by the small detector coils mounted on the large induction coil and the warning signals activated.





Steps in test procedure . . .

New Books:

Report on the Elevated Temperature Properties of Selected Super Strength Alloys, published by the American Society for Testing Materials. This is the third of a series on the effect of temperature on the properties of metals. Includes 116 curves showing tensile strength, elongation, reduced area, stress rupture and creep rate data. Paper cover, $4.75. 208 p.

"Hugh Roy Cullen: A story of American Opportunity," by E. Kilman and T. Wright. This biography traces from boyhood the career of the wealthy, Texas oil man. Prentice-Hall, Inc., 70 Fifth Ave., New York 11. 376 p. $4.00.

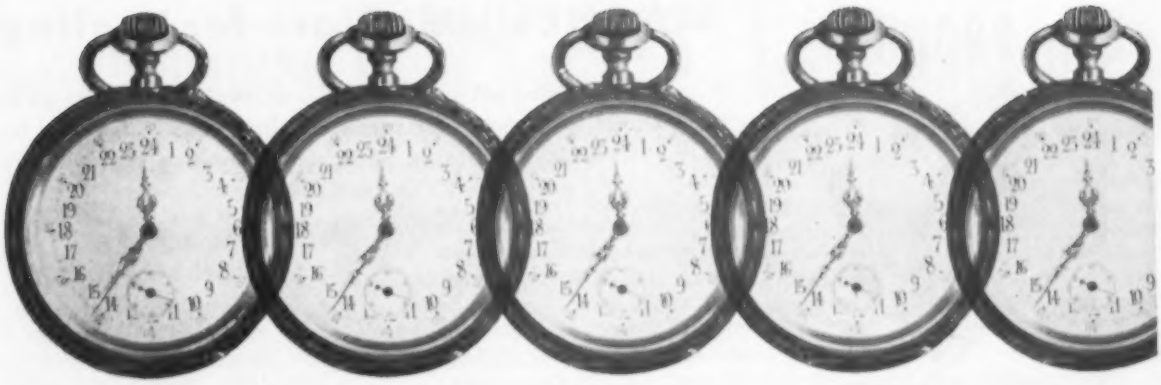
"A Dictionary of Electronic Terms." Contains over 3500 terms used in television, radio and industrial electronics. Allied Radio Corp., 100 N. Western Ave., Chicago 30, Ill. 72 p. 25¢

"Projects in Metal for Home and School Shop." Contains details for making 78 home projects in steel. Plans and instructions are given. Projects are for household, recreational, shop and service equipment. James F. Lincoln Arc Welding Foundation, Cleveland 17. 80 p. 50¢ in U. S.; 75¢ elsewhere.

"Investment for Jobs." Discusses the growth of the labor force, the growth of investment in job-making facilities and investment funds. Economic Research Dept., Chamber of Commerce of the U. S., Washington 6, D. C. 50¢. 29 p.

"Sharing in Our Expanding Economy: Guides to Planning and Financing Company Progress." Financial Management Series No. 107. Looks at the over-all economy, and suggests how controllers and others concerned with corporate finance can take advantage of indicated trends and benefits offered by new legislation. American Management Assn., 330 W. 42nd St., New York. 35 p. $1.75; $1.00 to AMA members.

You're Just Hours Away...



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MAGNESIUM: Plate for Tooling

Rolled plate from ¼ to 3 in. thick and in sizes up to 6 x 24 ft available for tooling applications . . . Suitable for checking fixtures, bases, gages, routing and drill jigs.

An important new metals development, plate magnesium for tooling applications, will be featured at the ASTE Western Industrial Exposition in Los Angeles next March according to The Dow Chemical Co., Midland, Mich.

The low cost rolled magnesium plate is now available in from ¼ to 3-in. thicknesses and in sizes to 6 ft wide by 24 ft long for many types of tooling and other uses in hundreds of industries.

FOR MORE DATA ON MATERIALS

More information on any item reported in this section may be obtained by using the reply card on page 129. Indicate the page on which the item appears and note exactly the information wanted.

Easy to Fabricate

Easiest of all metals to machine, magnesium's light weight and weldability allow safe, fast, simple fabrication. Other features of the new plate include:

1. High stiffness-to-weight ratio (giving extra rigidity with considerable saving in weight).
2. Flatness of rolled plate (simplifies fabricating and minimizes machining).
3. Toughness and freedom from porosity (extreme working of the metal has eliminated possible flaws and greatly improves mechanical properties).
4. Dimensionable stability during and after machining (insured by stress-relieving above 700° F).
5. Alkaline resistance (enables its use in the production of plaster molds, bases for master plasters, etc.).
6. No galling of the magnesium or the work when forming such metals as aluminum.

Promising uses include: checking fixtures, bases and gages; assembly and locating jigs, fixtures and bases; routing and drill jigs; fusion and spot welding jigs and fixtures; adhesive fixtures, and vibration test fixtures.

Mag plate for tooling . . .

Lubrication:

Silicone oil stands high metal-to-metal pressures.

A new silicone lubricant with outstanding thermal and load bearing properties is being tested by Materials and Aviation Gas Turbine engineers of the Westinghouse Electric Corp.

The silicone fluid has satisfactorily passed thermal stability and viscometric tests ranging from −65°F to 500°F. Steel-to-steel bearing load tests have shown the fluid to have excellent lubricating qualities up to 107,000 psi bearing area.

Present commercial silicone oils are well known for their high de-

gree of thermal stability combined with a favorable viscosity-temperature relationship. These oils also possess desirable properties such as high flash temperature and low pour and freezing temperatures.

In spite of these good qualities, however, they have always been poor lubricants for ferrous metal surfaces under boundary lubricating conditions where the film of lubricant between surfaces approaches the thickness of two or three layers of molecules.

Molecule Modified

The problem of developing good lubricating properties for steel versus steel was approached through the modification of the silicone oil molecule. It was assumed that the conventional silicone molecule is not absorbed strongly enough on the steel surfaces to form a close-packed film or protecting layer or layers.

As a result, metal to metal contact is not prevented on parts that continually rub together. Research studies were thus concentrated on the alteration of the silicone oil molecule to produce a material capable of forcing a surface chemical reaction at the metal oil boundary.

High Metal-to-Metal Pressure

The new lubricant has been tested under the most severe laboratory induced conditions. One such device is the Shell four-ball testing machine. Here a steel ball is rotated while held against three steel balls. The entire assembly is immersed in a container filled with the fluid to be tested. While one ball is turned at a constant speed, the other three stationary balls can be accurately pressed against the rotating steel ball.

Metal to metal pressures can be built up until the parts actually "seize" or weld. It is in this piece of testing equipment that bearing pressures of 107,000 psi have been attained. Presently available jet engine lubricants will cause "seizure" of the metal parts between 14,000 to 27,000 psi bearing area.

Multiple spindle automatic builders do not deny the importance of good frame design. As early as 1920 Cone's revolutionary frame was substantial evidence that Cone did something about it.

For some time there has been discussion concerning the relative merits of the use of 100% carbide tooling on multiple spindle bar automatics. There has been very little information made available about successful carbide application to this type of machine by its builders or by carbide suppliers. But Cone is doing something about it.

The Conomatic Carbide Development program is accumulating much helpful information for "automatic" users through test runs under production conditions. The illustration is an example of such information applied to an actual production run. Full data is available.

Action speaks better

MATERIAL—ALUMINUM: Hole drilled with 1" and 1 5/16" dia. drills to 1½" depth, and tapped to ¾" depth.

	HSS	CARBIDE
Cycle Time	90 secs.	11 secs.
Work Spindle Speed	270 R.P.M. at 104 S.F.	830 R.P.M. at 320 S.F.
Tool Wear	5,000 pcs. per grind	20,000 pcs. per grind

Conomatic

CONE AUTOMATIC MACHINE COMPANY, INC. WINDSOR, VT., U.S.A.

Looking for a special "character" in Spring Steel, to improve your product?

Check with Sandvik

Wherever spring steel *performance* is vital, it pays to look into the "character" of the steel you specify. By "character" we mean the inherent quality of the material which enables it to meet tough physical demands.

Sandvik Swedish strip steels have a special "aptitude" for tough applications. (For example, take a look at the partial list below). The extraordinary "character" of Sandvik steel results from a basic purity of raw materials, plus specialized methods and close control maintained throughout processing. This assures consistent, successful performance coil after coil, lot to lot.

Sandvik cold rolled high carbon strip steel is available:

- **In special analyses for specific applications.**
- **Precision-rolled in thicknesses to fit your requirements.**
- **In straight carbon and alloy grades.**
- **Annealed, unannealed or hardened and tempered.**
- **Polished bright, yellow or blue.**
- **With square, round or dressed edges.**
- **Wide range of sizes in stock—also slitting facilities available.**

SANDVIK Swedish Specialty Strip Steels are used for Textile Machine Parts such as sinkers, needles, etc. • Band Saws (metal, wood and butcher) • Camera Shutters • Clock and Watch Springs • Compresser Valves • Doctor Blades • Feeler Gauges • Knives such as cigarette knives, surgical instruments, etc. • Razor Blades • Reeds • Shock Absorbers • A Wide Variety of Springs • Trowels • Vibrator Reeds • Piston Ring Segment and Expanders, etc.

Sandvik also supplies high quality Swedish Magnet Iron Strip and Wire for specialized electrical purposes such as direct current relays, electromagnetic brakes, couplings, chucks etc.

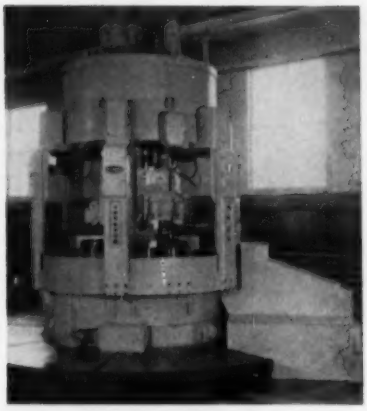
Ask your nearest Sandvik office for further information or technical assistance

SANDVIK STEEL, INC., 111 EIGHTH AVE., N. Y. 11, N. Y., WAtkins 9-7180

SS-93

NEW EQUIPMENT

New and improved production ideas, equipment, services and methods described here offer production economies . . . for more data use the free postcard on page 129 or 130



Increases production with greater operator efficiency

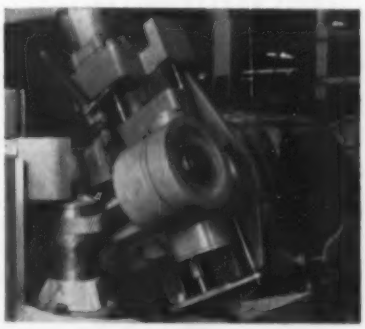
The Type L Mult-Au-Matic is Bullard's latest version of their multi-spindle vertical chucking machine. It incorporates new developments for the production of component parts in such industries as automotive, aircraft, agricultural machinery, Diesel engines, electrical and oil field tools. A control system facilitates head setting and tool adjustment with a minimum of effort on the part of the operator. A completely new screw type of feed mechanism provides a total stroke of 16 in. Mechanism that permits faster spindle carrier index contributes to reduction of time lost between cuts. Selective feeds and speeds at each work station are possible through the use of a new type gear synchronizer. Heavy construction of the machines permit input of up to 150 hp. Type L machines are available in 10-in. size built with 6, 8, 12 or 16 spindles; 14 and 18-in. sizes will have 6 or 8 spindles. All control units and gear units are readily accessible. *Bullard Co.*

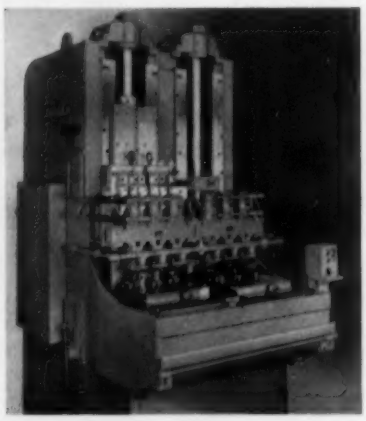
For more data circle No. 34 on postcard, p. 129.

Hobbing machine for mass production of helical gears

A feature of Hoblique, a new helical gear hobbing machine, is the combination of feeding the hob tangent to the helix of the gear being cut and the automatic TriLineal feeding cycle which provides three feed rates in series, two successive fast enter feeds at different rates, followed by the normal hobbing feed rate. The TriLineal feed along the helix angle is hydraulically operated; any lead screw error is eliminated; no differential or lead cam is required and change gear calculations are avoided entirely. Hob wear is distributed over the entire length of hob; no shifting of hob is needed. Hoblique embodies a fully automatic cycle actuated by a single pushbutton. *Gould & Eberhardt, Inc.*

For more data circle No. 35 on postcard, p. 129.





Broaches 24 plane surfaces on 3 parts in one cycle

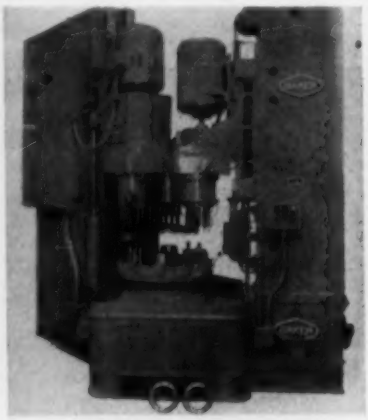
Using a Colonial Broach dual ram machine with a single operator, a manufacturer of tractors has centralized the broaching operation on 3 complex universal valve parts—spool, index bushing, valve seat. The operation involves broaching 24 separate plane surfaces on the three parts in one complete machine cycle at the rate of 315 parts per hr. Two, 3-station fixtures locate and clamp 6 pieces in the machine. Four pairs of paralleling flat surfaces are broached on the spool along with 10 adjacent shoulder surfaces at three stations on the left-hand ram and the left station on the right-hand ram. These are consecutive operations on the valve spool. Remaining two stations on right-hand ram are used for broaching two paralleling surfaces on the valve seat and two pairs of paralleling flats on the ends of the index bushing. All parts broached on the right-hand ram are complete parts. Surfaces are straddle-broached. *Colonial Broach Co.*

For more data circle No. 36 on postcard, p. 129.

Turn Page

Performs 30 operations

New Baker special machine performs 30 operations on differential ring gears for an automobile manufacturer. The machine spot drills to chamfer, drills, and taps 8 blind holes in steel. Features of the machine include individual lead-screw tapper with magnetic clutch control. Estimated parts per hour

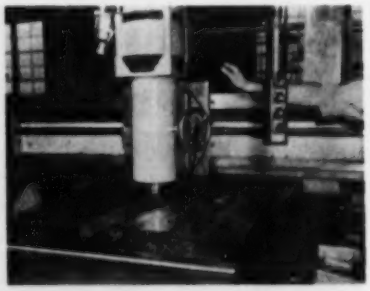


are 144. The Model 26 HO unit is used for the drilling and features twin pull cylinder construction. *Baker Brothers, Inc.*

For more data circle No. 37 on postcard, p. 129.

Milling head for planers

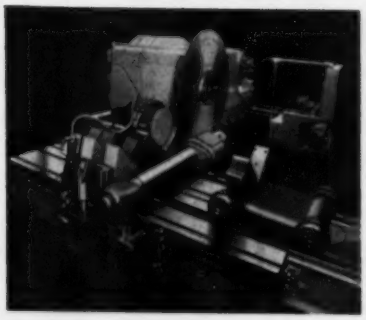
Motorized spindle will convert planers and old milling machine to high speed carbide milling. The milling spindle, driven by a 20 hp, 1200 rpm, glass wound, fan cooled



motor, is connected directly to the rotor of the motor, eliminating all gears. Choice of four table feeds ranging from 30 to 120 ipm is available. A Loadmeter will shut off the feed motors if the spindle is seriously overloaded. *Detroit Milling Cutter Co.*

For more data circle No. 38 on postcard, p. 129.

Circular saw cuts ferrous or nonferrous material



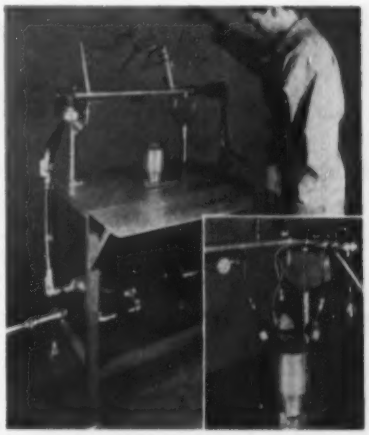
Stock up to 43 in. diam can be cut on the No. 5 model circular sawing machine. In the nonferrous, low-speed type illustrated, the saw carriage is mounted on a heavy base at right angles to a heavy T-slotted work supporting table. The saw carriage, single speed type, has additional feed variations available by means of sheave change or by change gears. Saw head is powered by a 30 hp 900 rpm motor connected by multiple belts and sheaves to the gear train. Face of spindle is 20 in. diam. Stock to be cut is placed in V block at front of the machine. Clamping is by hydraulic cylinder connected through linkage to a heavy roller chain. *Motch & Merryweather Machinery Co.*

For more data circle No. 39 on postcard, p. 129.

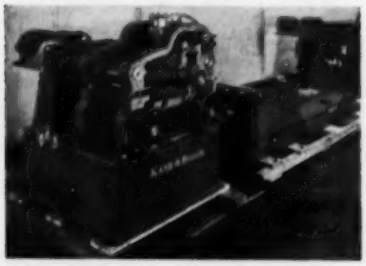
Production brazing method utilizes gas fuel

A new method for production brazing of aluminum heating elements utilizes gas fuel. Featuring automatic, precision heat for brazing, and high production rates, in conjunction with low fuel cost, the method is finding widespread use in the appliance industry and for aircraft hydraulic fittings. The technique is said to increase utensil heat transfer efficiency by as much as 400 pct, by enabling aluminum-sheathed heating elements to be brazed directly to the bottoms of aluminum cooking utensils. Automatic control heating cycles assure reproducible uniformity in brazing. Sound void-free joints are produced. The brazing method employs ceramic-lined, air-gas burners which are arranged in fixed position on a retractable manifold. Burners are adjustable to give precise heat pattern for different shape and size workpieces. Single-station, semi-automatic machines accommodate low production requirements; fully automatic, large production. *Selas Corp. of America.*

For more data circle No. 40 on postcard, p. 129.



Nine-roll leveller straightens coiled material



Two K&R No. 203 9-roll levellers complete with coil cradles are being used by a wheel manufacturer for straightening coiled material SAE 1015 from 0.100 to 0.165 in. thick and in widths of 5⅞ to 12 in. Two pinch rolls located at the feed end of the leveller are followed by seven staggered straightening rolls. The upper pinch roll is arranged with an air cylinder for raising and lowering to permit easy entrance of the coil end. Rolls are 4⅜ in. diam, power driven by 15 hp motor. Production speed is 150 fpm. *Kane & Roach, Inc.*

For more data circle No. 41 on postcard, p. 129.

Milling machine for all size toolrooms and shops

New milling machine for toolrooms, repair depots, tool and die shops, pattern shops, contract machine shops, and other metalworking companies of all sizes incorporates a number of innovations. Overarm is patterned after the Cincinnati design and mounted in dove-tail ways in the turret unit, permitting the operator to swivel and position the overarm for complete coverage of the table with the spindle head. Square gibbed saddle-knee bearing is a factor in ruggedness of construction. The knee bearing on the column is a departure from conventional design. Motors for manual and power feed to quill models are pancake type, integral with the spindle head. Eight spindle speeds are selected by changing one or two belts. Operating convenience is attained by lever operated clamps for the table, saddle, and knee. Toolmasters are available in 3 styles. Ranges are 16 in. longitudinal, 10 in. across, 17 in. vertical. Spindle head can be swiveled right or left for 90° cuts. *Cincinnati Milling Machine Co.*

For more data circle No. 42 on postcard, p. 129.

Turn Page

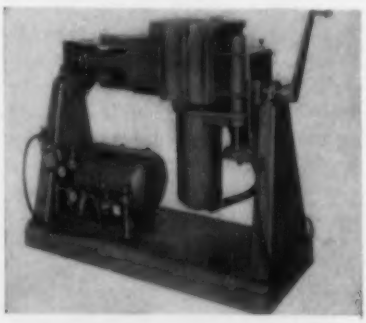
Drills and countersinks 100 holes per hr on rods

This horizontal drilling machine produces steel inserts (sprags), ⅜ in. square, for an automatic transmission assembly, but can be tooled for many jobs. Interlocked electrically for automatic operation, the machine has two hydraulic feeder units and two gearless drill heads. Twenty holes are drilled from one side in a rectangular rod of extruded bar stock at the first station, and the work is indexed manually to countersink the 20 holes from both sides at the second station. The bar is indexed progressively until a 10-ft piece is completely drilled. It is then put through an automatic punch press that cuts the bar into the sprags. *Zagar Tool, Inc.*

For more data circle No. 43 on postcard, p. 129.

Shell core blower

Either gravity-type investment or standard core-blowing techniques can be used on a new shell core blower. It is similar in operation to conventional core blowers, except that the core box is heated, and phenolic resin is used instead of conventional core binders. The machine is designed for use with



conventional core boxes. Completely cured shells, ready for setting, are produced at a rate of one core every 30-50 sec, depending upon the wall thickness desired. As the core is cured in the heated core box, most subsequent handling operations and drier plates and core ovens are completely eliminated. *Shalco Engineering Corp.*

For more data circle No. 44 on postcard, p. 129.

Rust, scale removal

Kelite Process 235 is a dry powder which in water solution removes hard water scale, rust, and paint from ferrous metals. At a concentration of 3 lb per gal of water at temperatures of 180° to 212°F it assures virtually complete removal of rust in 30 to 40 min. No electrolytic current is used and the material is non-acid. *Kelite Products, Inc.*

For more data circle No. 45 on postcard, p. 129.

More productive capacity features smallest Payloader

This new HA Payloader has twice as much lifting, digging and carrying capacities as its predecessor. The bucket has been increased 16 2/3 pct, giving a payload capacity of 18 cu ft and a struck-load capacity of 14 cu ft. Productive capacity has been increased 50 to 100 pct and maximum dumping height has been increased 18 pct. It is a more maneuverable machine with a shorter turning radius. Bucket arm design permits exceptional breakout action of the bucket and 40° tipback. Torque converter drive and full-reversing transmission assure fast operating cycles and ease of operation. *Frank G. Hough Co.*

For more data circle No. 46 on postcard, p. 129.

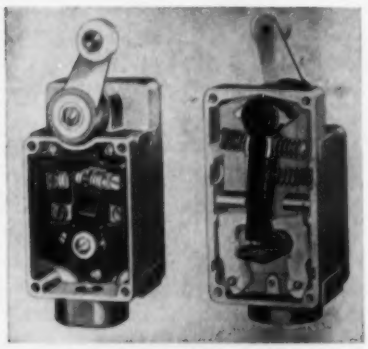
Carbide step cutters

Economy, efficient performance and versatility are features of new step cutters. They are recommended for machining any type wood, plastics and nonferrous metals. High grade carbon steel is used for the cutter body and a proven grade of carbide is used in the manufacture of the cutters. The cutters are staggered on the spindle forming steps which give intermittent cuts, allowing for faster feeds, smooth finish and reduced machine spindle strain. *Onsrud Cutter Mfg. Co.*

For more data circle No. 47 on postcard, p. 129.

Machine limit switch

New heavy-duty machine limit switch is designed for long life with minimum maintenance and greater ease in wiring. Features include increased wiring space, protection against excessive overtravel achieved without shear pins,



complete separation of electrical and mechanical mechanisms, and nylon-to-steel wearing surfaces. Switch is conservatively rated at 10 amp continuous capacity up to 600 v ac, 550 v dc. Available with ½ or ¾ in. conduit connections. *Clark Controller Co.*

For more data circle No. 48 on postcard, p. 129.

Turn Page

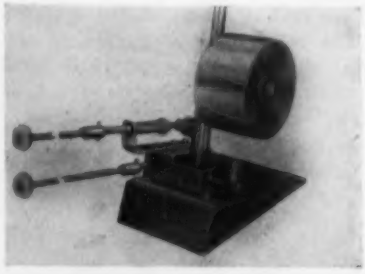
Grinding spindle reaches 200,000 rpm mechanically

Maximum speed of 200,000 rpm claimed for this internal grinding spindle makes possible the grinding of small holes especially in carbide materials. Known as the Wagner contact roller spindle, it is actually three spindles in one. There are three pulleys which run in matched and selected ball bearing at speeds not exceeding 50,000 rpm. By means of a differential type of drive the speed of the grinding wheel is multiplied over the speed of the pulleys by a ratio of 1:4, 1:5, or 1:6 depending on the specific application. Despite the exceedingly high speed the spindle is said to have virtually unlimited longevity. *Columbia International Corp.*

For more data circle No. 49 on postcard, p. 129.

Abrasive belt backstand

New bench model abrasive belt backstand, Model 524, converts present grinder or polisher into a modern, fast cutting, time saving abrasive belt machine. It is designed for production work on



light polishing or deburring operations. Belts up to 4 in. wide can be used. Mounting bracket for floor or wall facilitates easy installation. Extension controls for tracking and tensioning permit adjustments to be made at operator's working position. *Hammond Machinery Builders.*

For more data circle No. 50 on postcard, p. 129.

Mist coolant system

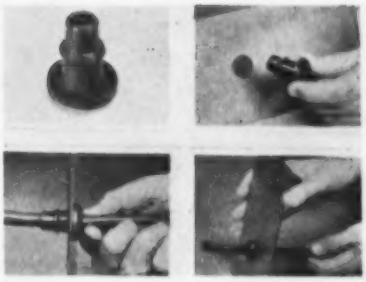
Cooling with mist cools by the expansion of compressed air, the evaporation of minute liquid particles and the circulation of air. Mist is generated at the tip of the nozzle and is regulated by a simple needle valve in the air line which is mounted on the coolant container. Small nozzle and the small, flexible tubing are held in place by a clip and magnet. Ordinary shop air pressure is used—25 to 30 lb pressure. Mistic Mist systems are compact and portable; may be installed from one machine to another in minutes. *Aetna Mfg. Co.*

For more data circle No. 51 on postcard, p. 129.

Rubber grommet solves design, fabrication design

The Moorhead roll-lock grommet will serve as pressure seal, parts positioner, vibration dampener as well as insulator. It takes final shape after attachment. One end of the grommet features a taper design. This end is inserted into hole of product or part. Then cable, tubing or wire which is to be secured is inserted through the hollow center of the grommet for the desired length plus several inches. When the wire or tube is pulled in a reverse direction, the tapered end rolls and locks into position forming a secure seal. The grommet can be installed instantly. Is available in range of sizes. *Stalwart Rubber Co.*

For more data circle No. 52 on postcard, p. 129.



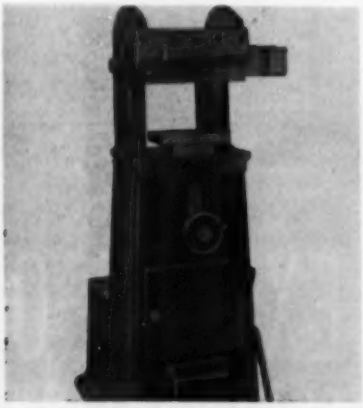
Tap extensions

Tap extensions, added to Walton's line of labor saving tools, are for tapping in places where it is difficult or impossible to turn a tap wrench without lengthening the tap. Tap extensions are packaged as a set containing two 5-in. extensions which can be used singly or in combination. Tools are of special alloy steel with square openings conforming to leading tap manufacturers standards. *Walton Co.*

For more data circle No. 53 on postcard, p. 129.

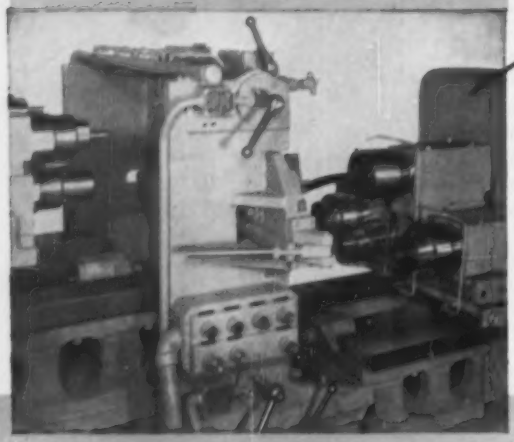
Hydraulic marker

For universal use on most materials and contours a hydraulic marking machine indelibly stamps lettering, trademarks, knurling, graduations and other legends on flat, concave or convex surfaces with speed and ease. Features include foot pedal to allow operator the use of both hands, cushioned hydraulic pressure to eliminate contact shock on marking tools, and simplified controls to permit operation by unskilled hands. *Parker Stamp Works, Inc.*



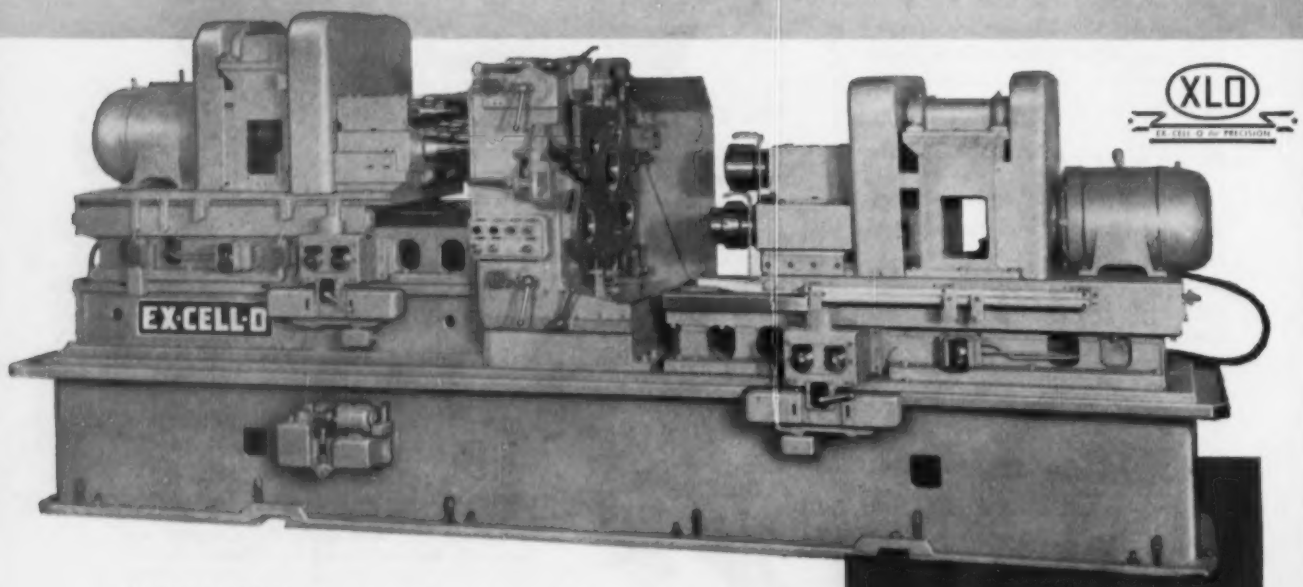
For more data circle No. 54 on postcard, p. 129.

Individual spindles are used for each bore to insure accuracy of location.



27 PRECISION OPERATIONS ON 9 HOLES IN ONE CYCLE

Another Cost-Saving, Multiple-Operation Machine by EX-CELL-O



SITUATION: The part is a magnesium center plate for a gear box. It's 27½" high and 30½" wide, has holes varying in size from 1⅛" to 6 15/16". Operations are semi-finishing, finish-boring and chamfering 8 holes, and finish-boring, plunge-facing a shoulder and chamfering the 9th hole, which is blind—a total of 27 precision operations.

SOLUTION: The use of this heavy duty, way-type, precision boring machine makes it possible to complete all operations in one cycle, and to hold the required limits. The total tolerance on each of 9 bore diameters is .001", and the location of the bores are held within plus or minus .001".

For suggestions on your precision machining problems, call your Ex-Cell-O representative or contact Ex-Cell-O in Detroit.

Heavy Duty, Way-Type Precision Boring Machine

EX-CELL-O CORPORATION
DETROIT 32, MICHIGAN

MANUFACTURERS OF PRECISION MACHINE TOOLS • GRINDING SPINDLES CUTTING TOOLS • RAILROAD PINS AND BUSHINGS • DRILL JIG BUSHINGS AIRCRAFT AND MISCELLANEOUS PRODUCTION PARTS • DAIRY EQUIPMENT

54-41

The Iron Age SUMMARY...

Far Eastern crisis adds strength to steel demand ... Railroad buying on the increase ... Operating rate may hit 90 pct or more.

New Business ... The calculated risk flavor of our Far Eastern policy has given additional zip to an already strong steel market. Emphasis recently has been on auto buying of steel and the tightness in certain flat rolled steel items. But for several weeks now steel demand from other sources and for other steel products has surged.

Within the past week order books at some steel companies show a bigger backlog than at any time since the downtrend began in steel 18 months ago. Lost in the shuffle of talk about whether or not automotive support for steel production can be maintained are the following optimistic factors:

(a) A strong plate market potential to be realized because of large line pipe projects (b) renewed freight car buying by railroads (c) increased demand from the construction industry and (d) the beginning of a seasonal pickup (on top of general recovery) in steel order volume.

The New Look ... But what has caused some consumers to put more steam into their steel buying has been the recognition that their steel inventories are too low in the face of their own operations and in view of the international picture. Some of these customers are recalling the run on materials when the Korean War broke out. Such a hysteria has not and probably will not again invade the steel market. But many users are taking a "new look" at their steel supplies.

Many steel customers have realized only within the past week that in making forward plans for steel consumption they face: A labor and price situation in steel; an equal if not heavier impact in defense procurement; and the realization that there is not too much leeway between the present operating rate and capacity operations.

Railroad Buying Up ... More or less quietly railroad buying of freight cars has taken a terrific jump within the past week to 10 days. More than 5800 freight cars have been ordered. Included in this total are 3300 for export to India. While railroad demand for rails and track accessories has not expanded in the East it has already picked up among western railroads.

The steel ingot rate for the country will end up this week at 86 pct of capacity, up one point from last week's revised rate. This is a new high since the upturn in steel activity. There is reason to believe that the rate will go to 90 pct or higher before the peak is reached in the current upward movement.

Steel Output, Operating Rates

	This Week†	Last Week	Month Ago	Year Ago
Production (Net tons, 000 omitted)	2,061	2,051	1,960	1,774
Ingot Index (1947—49=100)	128.3	127.7	122.0	110.4
Operating Rates				
Chicago	87.0	87.5	83.5	84.0
Pittsburgh	82.0	82.0*	77.0	89.0
Philadelphia	78.0	76.0	70.0	78.0
Valley	86.0	85.0*	79.0	70.0
West	89.0	89.0*	84.0	65.0
Detroit	89.0	91.0	91.0	77.0
Buffalo	100.0	100.0	100.0	79.0
Cleveland	82.0	83.0*	83.0	75.0
Birmingham	79.0	74.0	74.5	80.5
S. Ohio River	95.5	95.5	94.5	74.5
Wheeling	98.0	100.0*	93.0	79.0
St. Louis	89.0	87.5	74.5	36.5
Northeast	45.0	45.0*	74.5	73.0
Aggregate	86.0	85.0*	81.0	74.0

*Revised. †Tentative

Prices At A Glance

(cents per lb unless otherwise noted)

	This Week	Week Ago	Month Ago	Year Ago
Composite prices				
Finished Steel, base	4.797	4.797	4.797	4.634
Pig Iron (gross ton)	$56.59	$56.59	$56.59	$56.59
Scrap, No. 1 hvy (gross ton)	$35.50	$35.50	$34.17	$27.33
Nonferrous				
Aluminum, ingot	23.20	23.20	22.20	21.50
Copper, electrolytic	33.00	30.00	30.00	29.75
Lead, St. Louis	14.80	14.80	14.80	12.80
Magnesium, ingot	27.75	27.75	27.75	27.75
Nickel, electrolytic	67.67	67.67	67.67	63.08
Tin, Straits, N. Y.	90.25	88.50	87.125	85.00
Zinc, E. St. Louis	11.50	11.50	11.50	9.50

Pipeline Jobs May Firm Plate

Linepipe demand upturn already felt . . .Projected jobs in Pacific Northwest and Canada starting this spring need 5000 miles of large pipe . . . Plate order books filling.

◆ WATCH the plate market. It could blossom into a really strong product within a month. Producers already are beginning to feel effect of demand for linepipe applications. And there's more to come.

Pending and authorized pipelines, some scheduled to get underway in the spring—including the two biggest—could tighten order books of producers beginning in March and continuing into the fall.

These projects include the Pacific Northwest lines and the Trans-Canadian line, both Big-Inch jobs totaling nearly 5000 mi. of large-diameter pipe. They will begin to move in the spring or early summer.

Not all of this linepipe will be electricweld made from plate, but a good proportion of it will be.

Another product that will bear watching is bars. This product at the moment is just so-so. But the Formosa situation is potentially explosive. And bars will be in heavy demand should the military step up its requirements.

Oil country goods and structurals are also due for a resurgence, as well drilling and construction prepare to snap out of their lethargy.

Wire products are beginning to move up as farm demand and construction begin to make themselves felt. Still strong are cold-rolled sheets, enameling sheets, galvanized sheets, tinplate, and electrical sheets. Improving steadily are hot-rolled sheets, cold-rolled strip, and stainless.

SHEETS AND STRIP . . . With cold-rolled sheets strong in all districts, hot-rolled is gaining strength rapidly. Hot-rolled is 3-5 weeks in **Chicago**; 4-6 weeks in the **East**; into March in **Detroit, Cleveland** and **Pittsburgh**. For drawing quality hot-rolled one **Chicago** mill advanced "over 32-in." to 8-week delivery. With slit coils becoming harder to get, cold-rolled strip is getting stronger. There is some evidence of speculative buying on cold-rolled in the **East** which is booked through April for most producers. Major producers are putting an informal allocation system into effect. They will not fill orders on cold sheets, galvanized, etc.

BARS . . . This product could be a sleeper. Although still on relatively short delivery, consumers are beginning to step up their purchases. **Chicago** hears of one consumer who is buying against the possibility of a shortage in mid-second quarter. This is an isolated case, however. Far-seeing steel users are watching Formosan developments closely for possible effect on bar demand in near future.

PLATES . . . Linepipe ordering not a big factor yet but producers look for a real scramble beginning in March and continuing through summer. Meanwhile, construction equipment, farm demand, and car-building have strengthened market. One mill in **Chicago** has advanced delivery dates to 4 weeks on Universal Mill plate. Demand is better on **West Coast**, where mills are booked well into March due to advance ordering for linepipe.

STRUCTURALS . . . With another good construction year looming, this product is bound to tighten up soon. Signs of stronger demand have appeared already in **Pittsburgh, Chicago,** and the **East.** Still slack in **Detroit** and **West Coast.**

TUBULAR PRODUCTS . . . Steady improvement in linepipe looked for beginning in March. Meanwhile, oil country goods improving, but a pinch is not expected until late first quarter. Merchant pipe continues at a fair-to-strong pace and the outlook is good considering predictions that 1.2 million homes will be built this year.

WIRE PRODUCTS . . . All districts report a noticeable pickup in demand for merchant wire, indicating start of a seasonal push by the farm market. January - February orders for merchant wire are running ahead of last year in **Chicago.** Meanwhile, manufacturers' wire continues strong. Construction wire products also beginning to improve. Manufacturers' wire deliveries are at 3-5 weeks in **Cleveland** but warehouses are holding back and agriculture is improving at a noticeably better rate than several weeks ago. Manufacturers' wire is up slightly in the **East** and seasonal slump in merchant products was less than expected; first quarter merchant wire ordering shows an increase. In **Pittsburgh,** manufacturers' wire demand is fair with merchant and construction products due to pick up.

WAREHOUSE . . . Pickup in demand is slower than most distributors would like. Although some strip and sheet orders from an automotive consumer who normally buys direct from the mill are said to be floating around **Chicago,** there's no indication that warehouses are getting much, if any, overflow from the mills. Opinion in **Chicago** is that first quarter will be the best in the last five quarters. Some unlucky mill customers, including automotive suppliers, appliances and hardware, are turning to warehouses to make up deficits; several warehouses are placing orders through June, particularly on cold-rolled sheets. Business is steady on **West Coast,** running on a par with November and December. **Cleveland** distributors also picking up a few consumers who normally buy from the mills; some of this is due to 30-day credit terms of warehouses.

Purchasing Agent's Checklist

PAINT: Researchers aim to slash maintenance bill ..... p. 67

CONSTRUCTION: Sales of all types of equipment perk up ..... p. 74

TITANIUM: U. S. may ask for expanded output ..... p. 76

STEEL: Newport opens a new cold mill ..... p. 78

Comparison of Prices

(Effective Feb. 1, 1955)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*.

	Feb. 1 1955	Jan. 25 1955	Jan. 4 1955	Feb. 2 1954
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	4.05¢	4.05¢	4.05¢	3.925¢
Cold-rolled sheets	4.95	4.95	4.95	4.775
Galvanized sheets (10 ga.)	5.45	5.45	5.45	5.275
Hot-rolled strip	4.05	4.05	4.05	3.925
Cold-rolled strip	5.79	5.79	5.79	5.513
Plate	4.225	4.225	4.225	4.10
Plates wrought iron	9.30	9.30	9.30	9.30
Stainl's C-R strip (No. 302)	41.50	41.50	41.50	41.50
Tin and Terneplate: (per base box)				
Tinplate (1.50 lb.) cokes	$9.05	$9.05	$9.05	$8.95
Tinplate, electro (0.50 lb.)	7.75	7.75	7.75	7.65
Special coated mfg. ternes	7.85	7.85	7.85	7.75
Bars and Shapes. (per pound)				
Merchant bars	4.30¢	4.30¢	4.30¢	4.16¢
Cold-finished bars	5.40	5.40	5.40	5.20
Alloy bars	5.075	5.075	5.075	4.875
Structural shapes	4.25	4.25	4.25	4.10
Stainless bars (No. 302)	35.50	35.50	35.50	35.50
Wrought iron bars	10.40	10.40	10.40	10.40
Wire: (per pound)				
Bright wire	5.75¢	5.75¢	5.75¢	5.525¢
Rails. (per 100 lb.)				
Heavy rails	$4.45	$4.45	$4.45	$4.325
Light rails	5.35	5.35	5.35	5.20
Semifinished Steel: (per net ton)				
Rerolling billets	$64.00	$64.00	$64.00	$62.00
Slabs, rerolling	64.00	64.00	64.00	62.00
Forging billets	78.00	78.00	78.00	75.50
Alloy blooms, billets, slabs	86.00	86.00	86.00	82.00
Wire Rod and Skelp: (per pound)				
Wire rods	4.675¢	4.675¢	4.675¢	4.525¢
Skelp	3.90	3.90	3.90	3.75
Finished Steel Composite: (per pound)				
Base price	4.797¢	4.797¢	4.797¢	4.634¢

	Feb. 1 1955	Jan. 25 1955	Jan. 4 1955	Feb. 2 1954
Pig Iron: (per gross ton)				
Foundry, del'd Phila.	$61.19	$61.19	$61.19	$61.19
Foundry, Valley	56.50	56.50	56.50	56.50
Foundry, Southern, Cin'ti	60.43	60.43	60.43	60.43
Foundry, Birmingham	52.88	52.88	52.88	52.88
Foundry, Chicago	56.50	56.50	56.50	56.50
Basic, del'd Philadelphia	60.27	60.27	60.27	60.27
Basic, Valley furnace	56.00	56.00	56.00	56.00
Malleable, Chicago	56.50	56.50	56.50	56.50
Malleable, Valley	56.50	56.50	56.50	56.50
Ferromanganese‡, cents per lb.	9.50¢	9.50¢	9.50¢	10.00¢
‡ 74-76 pct Mn base.				
Pig Iron Composite: (per gross ton)				
Pig iron	$56.59	$56.59	$56.59	$56.59
Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	$36.50	$36.50	$36.50	$29.50
No. 1 steel, Phila. area	35.50	35.50	31.50	26.50
No. 1 steel, Chicago	34.50	34.50	34.50	26.00
No. 1 bundles, Detroit	29.00	27.50	26.50	20.50
Low phos., Youngstown	36.50	36.50	36.50	30.50
No. 1 mach'y cast, Pittsburgh	43.50	43.50	42.50	42.50
No. 1 mach'y cast, Philadel'a	43.50	43.50	42.00	39.00
No. 1 mach'y cast, Chicago	44.50	45.00	44.50	33.50
Steel Scrap Composite: (per gross ton)				
No. 1 heavy melting scrap	$35.50	$35.50	$34.17	$27.33
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	$14.38	$14.38	$14.38	$14.38
Foundry coke, prompt	16.75	16.75	16.75	16.75
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electrolytic, Conn.	$33.00	$30.00	$30.00	$29.75†
Copper, Lake, Conn.	33.00	30.00	30.00	30.00
Tin, Straits, New York	90.25†	88.50*	87.125	85.00
Zinc, East St. Louis	11.50	11.50	11.50	9.50
Lead, St. Louis	14.80	14.80	14.80	12.80
Aluminum, virgin ingot	23.20	23.20	22.20	21.50
Nickel, electrolytic	67.67	67.67	67.67	63.08
Magnesium, ingot	27.75	27.75	27.75	27.75
Antimony, Laredo, Tex.	28.50	28.50	28.50	28.50

† Tentative. ‡ Average. * Revised.

Finished Steel Composite

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Steel Scrap Composite

Average of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

←To identify producers, see Key on P. 187→

Producing Point	Basic	Fdry.	Mall.	Bess.	Low Phos.
Bethlehem *B3*	58.00	58.50	59.00	59.50	.....
Birmingham *R3*	52.38	52.88	.....	.....	.....
Birmingham *W9*	52.38	52.88	.....	.....	.....
Birmingham *U4*	52.38	52.88	56.50	.....	.....
Buffalo *R3*	56.00	56.50	57.00	.....	.....
Buffalo *I11*	56.00	56.50	57.00	.....	.....
Buffalo *W6*	56.00	56.50	57.00	.....	.....
Chicago *I4*	56.00	56.50	56.50	57.00	.....
Cleveland *A5*	56.00	56.50	56.50	57.00	61.00
Cleveland *R3*	56.00	56.50	56.50	.....	.....
Daingerfield *L3*	52.50	52.50	52.50	.....	.....
Duluth *I4*	56.00	56.50	56.50	57.00	.....
Erie *I4*	56.00	56.50	56.50	57.00	.....
Everett *M6*	.....	61.00	61.50	.....	.....
Fontana *K1*	42.00	42.50	.....	.....	.....
Geneva, Utah *C7*	56.00	56.50	.....	.....	.....
Granite City *G2*	57.90	58.40	58.90	.....	.....
Hubbard *Y1*	.....	.....	56.50	.....	.....
Minnequa *C6*	58.00	59.00	59.00	.....	.....
Monessen *P6*	56.00	.....	.....	.....	.....
Neville Isl. *P4*	56.00	56.50	56.50	.....	.....
Pittsburgh *U1*	56.00	.....	.....	57.00	.....
Sharpsville *S3*	56.00	56.50	56.50	57.00	.....
So. Chicago *R3*	56.00	.....	56.50	.....	.....
Steelton *B3*	58.00	58.50	59.00	59.50	64.00
Swedeland *A2*	58.00	58.50	59.00	59.50	.....
Toledo *I4*	56.00	56.50	56.50	57.00	.....
Troy, N. Y. *R3*	58.00	58.50	59.00	59.50	64.00
Youngstown *Y1*	.....	.....	56.50	57.00	.....
N. Tonawanda *T1*	.....	56.50	57.00	.....	.....

DIFFERENTIALS: Add 50¢ per ton for each 0.25 pct silicon over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct) 50¢ per ton for each 0.50 pct manganese over 1 pct, $2 per ton for 0.5 to 0.75 pct nickel, $1 for each additional, 0.25 pct nickel. Subtract 38¢ per ton for phosphorus content 0.70 and over.

Silvery Iron: Buffalo, *H1*, $66.25; Jackson, *J1, G1*, $65.00. Add $1.00 per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 17 pct. Add $1 per ton for 0.75 pct or more phosphorus. Add 75¢ for each 0.50 pct manganese over 1.0 pct. Bessemer ferrosilicon prices are $1 over comparable silvery iron.

STAINLESS STEEL

Base price cents per lb. f.o.b. mill.

Product	301	302	303	304	316	321	347 Cb	410	416	430
Ingots, rerolling	16.75	17.75	19.25	19.00	29.75	23.50	25.50	14.00	—	14.25
Slabs, billets, rerolling	21.00	23.25	25.25	24.50	38.00	30.25	46.75	18.25	—	18.50
Forg. discs, die blocks, rings	39.00	39.00	42.00	41.25	61.75	46.25	—	31.00	31.75	31.75
Billets, forging	30.00	30.25	32.75	31.75	48.25	36.00	54.75	24.00	24.50	24.50
Bars, wires, structurals	35.75	36.00	38.75	38.00	57.25	42.75	64.25	28.75	29.25	29.25
Plates	37.75	38.00	40.25	40.50	60.50	46.50	69.25	30.00	30.50	30.50
Sheets	41.75	42.00	49.25	44.50	64.50	51.25	77.50	34.25	41.25	34.75
Strip, hot-rolled	30.25	32.50	37.25	35.00	55.00	41.75	63.00	26.25	—	27.00
Strip, cold-rolled	38.75	42.00	46.00	44.50	64.50-64.75	51.25-51.50	77.50	34.25	41.25	34.75

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., *C11*; Brackenridge, Pa., *A3*; Butler, Pa., *A7*; McKeesport, Pa., *U1*; Washington, Pa., *W2, J2*; Baltimore, *E1*; Middletown, O., *A7*; Massillon, O., *R3*; Gary, *U1*; Bridgeville, Pa., *U2*; New Castle, Ind., *I2*; Ft. Wayne, *J4*.

Strip: Midland, Pa., *C11*; Cleveland, *A5*; Carnegie, Pa., *S9*; McKeesport, Pa., *F1*; Reading, Pa., *C2*; Washington, Pa., *W2*; W. Leechburg, Pa., *A3*; Bridgeville, Pa., *U2*; Detroit, *M2*; Canton-Massillon, O., *R3*; Middletown, O., *A7*; Harrison, N. J., *D3*; Youngstown, *C5*; Sharon, Pa., *S1*; Butler, Pa., *A7*; Wallingford, Conn., *U3* (.25¢ per lb higher) *W1* (.25¢ per lb higher); New Bedford, Mass., *R6*.

Bar: Baltimore, *A7*; Duquesne, Pa., *U1*; Munhall, Pa., *U1*; Reading, Pa., *C2*; Titusville, Pa., *U2*; Washington, Pa., *J2*; McKeesport, Pa., *U1, F1*; Bridgeville, Pa., *U2*; Dunkirk, N. Y., *A3*; Massillon, O., *R3*; Chicago, *U1*; Syracuse, N. Y., *C11*; Watervliet, N. Y., *A3*; Waukegan, *A5*; Canton, O., *T5*; Ft. Wayne, *I4*.

Wire: Waukegan, *A5*; Massillon, O., *R3*; McKeesport, Pa., *F1*; Ft. Wayne, *J4*; Harrison, N. J., *D3*; Baltimore, *A7*; Dunkirk, *A3*; Monessen, *P1*; Syracuse, *C11*; Bridgeville, *U1*.

Structurals: Baltimore, *A7*; Massillon, O., *R3*; Chicago, Ill., *J4*; Watervliet, N. Y., *A3*; Syracuse, *C11*.

Plates: Brackenridge, Pa., *A3*; Chicago, *U1*; Munhall, Pa., *U1*; Midland, Pa., *C11*; New Castle, Ind., *I2*; Middletown, *A7*; Washington, Pa., *J2*; Cleveland, Massillon, *R3*; Coatesville, Pa., *C15*.

Forged discs, die blocks, rings: Pittsburgh, *C11*; Syracuse, *C11*; Farndale, Mich., *A3*; Washington, Pa., *J2*.

Forgings billets: Midland, Pa., *C11*; Baltimore, *A7*; Washington, Pa., *J2*; McKeesport, *F1*; Massillon, Canton, O., *R3*; Watervliet, *A3*; Pittsburgh, Chicago, *U1*; Syracuse, *C11*.

Market Undertone Is Strong

Prices holding firm in all centers . . . Some mills finding scrap scarce at going rates . . . Detroit market rises . . . Composite price remains at $35.50.

◆ CONTINUED high rate of steelmaking in most districts, plus strong export market kept prices of openhearth grades firm in most steelmaking centers last week. In Detroit openhearth and blast furnace grades all were up from $1 to $2, and the market there was expected to remain strong as February automotive lists brought higher prices than last month.

In Cleveland machine shop turnings were up $3 a ton and end-of-the-month industrial lists were going at $1 higher. Broker speculation was reported heavy. Firmness was felt in New York, too, where openhearth grades remained at last week's increased price levels.

THE IRON AGE Heavy Melting Steel Scrap Composite was at $35.50 per gross ton—the same as last week.

Pittsburgh . . . Market undertone is strong. Prices are firm. Brokers are having trouble rounding up material on new order for No. 1 steel at $37. Practically speaking, the "local" price of $34.50 on No. 1 is meaningless. Bulk of the scrap is moving at $37. A specialty producer with a plant on the extreme edge of the district has bought at a price equivalent to prevailing market here. Paradoxically, a large consumer has held up on deliveries to one plant; but brokers feel that new orders for other units may be in the offing.

Chicago . . . The market here showed momentary signs of weakening, but this is regarded as a temporary situation. Basic strength remains, however. On a substantial tonnage, turnings backed off $1. No. 1 RR continued to hold at last week's price but other rail grades, which have been over differential for months, began to ease. Some RR heavy melting has begun to move out of the immediate Chicago area because of the relatively low price here.

Philadelphia . . . Market holding firm as a result of last week's large tonnage sale of No. 1 steel. Low phos grades moved up in sympathy, although there were few sales to report. Export business continues steady, absorbing the price increases. With one exception reported, the smaller consumers in the district have made only nominal purchases of industrial material since last week's price rise.

Cleveland . . . Four local and Valley steel producers came into the market last week for over 30,000 tons of blast furnace grades to get out all the hot metal possible. Machine shop turnings rose up to $3 per ton at top levels on basis of the sale with Cleveland the hot spot for blast furnace tonnage. Additional smaller sales of No. 1 heavy melting at $37 in the Valley kept that market firm. End-of-month industrial lists were also going at about same to $1 higher with heavy broker speculation.

Buffalo . . . Price on No. 2 heavy melting steel and No. 2 bundles jumped $2 a ton and short turnings advanced 50¢ on buying by a top mill consumer. Orders called for fair tonnages and were placed with several dealers. Advance reflected the continued operation at 100 pct. No. 1 material is nominally unchanged.

Detroit . . Feeling the influence of strong eastern demand, Detroit openhearth and blast furnace grades all jumped from $1 to $2. Furthermore, continued strength seemed to be in prospect as February automotive lists also brought higher prices than a month ago, No. 1 bundles bringing $31.50 to $32 on track. Detroit mills all have comfortable inventories, but continue to stay in the market.

St. Louis . . . A few railroad items are up but a recent sale by one line has offset a previous advance by another to make No. 1 RR heavy melting steel unchanged. It is understood that Chicago brokers have been offering the item at East St. Louis because of inability to move it in Chicago at their asking price. Out-of-town demand has boosted angles and splice bars and RR spring steel $3.50 per ton. Cast iron car wheels are also up $1 per ton with the supply limited.

Boston . . . The New England scrap trade reports the best picture in months with a good level of activity accompanied by a rise in prices. And the activity is coming from both domestic consumers and exporters. Pittsburgh area mills remain quiet in this market but eastern Pennsylvania buyers have jumped in.

New York . . . Market remains firm at last week's increased prices for openhearth grades. Export business is, in the words of one dealer, booming along. Another source felt that there would be no further price increases until domestic buying increased. There were no price changes.

Birmingham . . . The steel scrap export market is so strong in the coast areas and reaching so far inland that dealers who are practically in the mill's backyards in the South can get more by selling for export than for domestic consumption, brokers say. The amount of tonnage moved from the interior thus far has been small, but dealers are beginning to hold on for higher mill prices. There was talk this week of $32 for No. 2 steel in New Orleans, though no sales were reported.

Cincinnati . . . One area mill came into the market for blast furnace scrap at $1 higher as two barge loads of No. 2 bundles went upriver to Pittsburgh for $27 delivered last week. Dealers are working hard to cover mill orders for additional blast furnace material. Rail scrap went up $1 last week.

West Coast . . . Heavy export activity continues in Seattle, Los Angeles, San Francisco areas, with the latter doing major part of volume. A boat can be loaded out of San Francisco for about $200 a ton less than the other two ports. And scrap prices in San Francisco Bay area are lower because mill demand is weaker. Higher prices in Seattle are holding and no change expected in February. Los Angeles prices will probably hold at same levels. However, new mill commitments for February could change picture. Cast scrap market in Los Angeles which has been softening for several weeks, firmed at $42.00

Scrap Prices *(Effective Feb. 1, 1955)*

Pittsburgh

No. 1 hvy. melting	$36.00 to $37.00
No. 2 hvy. melting	33.00 to 34.00
No. 1 bundles	36.00 to 37.00
No. 2 bundles	33.00 to 34.00
Machine shop turn.	18.50 to 19.50
Mixed bor. and ms. turns.	18.50 to 19.50
Shoveling turnings	22.50 to 23.50
Cast iron borings	22.50 to 23.50
Low phos. punch'gs, plate	40.00 to 41.00
Heavy turnings	33.00 to 34.00
No. 1 RR. hvy. melting	38.00 to 39.00
Scrap rails, random lgth.	44.00 to 45.00
Rails 2 ft and under	48.00 to 49.00
RR. steel wheels	41.50 to 42.50
RR. spring steel	41.50 to 42.50
RR. couplers and knuckles	41.50 to 42.50
No. 1 machinery cast.	43.00 to 44.00
Cupola cast	38.00 to 39.00
Heavy breakable cast.	34.00 to 35.00

Chicago

No. 1 hvy. melting	$34.00 to $35.00
No. 2 hvy. melting	31.00 to 32.00
No. 1 factory bundles	36.00 to 37.00
No. 1 dealers' bundles	34.00 to 35.00
No. 2 dealers' bundles	24.00 to 25.00
Machine shop turn.	16.00 to 17.00
Mixed bor. and turn.	18.00 to 19.00
Shoveling turnings	18.00 to 19.00
Cast iron borings	18.00 to 19.00
Low phos. forge crops	35.00 to 35.00
Low phos. punch'gs, plate	36.00 to 38.00
Low phos. 3 ft and under	35.00 to 37.00
No. 1 RR. hvy. melting	37.00 to 38.00
Scrap rails, random lgth.	41.00 to 42.00
Rerolling rails	51.00 to 52.00
Rails 2 ft and under	48.00 to 49.00
Locomotive tires, cut	36.00 to 37.00
Cut bolsters & side frames	37.00 to 38.00
Angles and splice bars	43.00 to 44.00
RR. steel car axles	41.00 to 42.00
RR. couplers and knuckles	38.00 to 39.00
No. 1 machinery cast.	44.00 to 45.00
Cupola cast.	40.00 to 41.00
Heavy breakable cast	32.00 to 33.00
Cast iron brake shoes	33.00 to 34.00
Cast iron car wheels	35.00 to 36.00
Malleable	44.00 to 45.00
Stove plate	33.00 to 35.00

Philadelphia Area

No. 1 hvy. melting	$35.00 to $36.00
No. 2 hvy. melting	32.00 to 33.00
No. 1 bundles	35.00 to 36.00
No. 2 bundles	26.50 to 28.00
Machine shop turn.	19.00 to 20.00
Mixed bor. short turn.	19.00 to 20.00
Cast iron borings	19.00 to 20.00
Shoveling turnings	21.00 to 22.00
Clean cast chem. borings	27.00 to 28.00
*Low phos. 5 ft and under	37.00 to 38.00
*Low phos. 2 ft and under	38.00 to 39.00
*Low phos. punch'gs	38.00 to 39.00
*Elec. furnace bundles	36.00 to 37.00
*Heavy turnings	34.00 to 35.00
RR. steel wheels	36.00 to 37.00
RR. spring steel	36.00 to 37.00
Rails 18 in. and under	49.00 to 50.00
Cupola cast.	34.00 to 35.00
Heavy breakable cast.	36.00 to 37.50
Cast iron car wheels	41.00 to 42.00
Malleable	41.00 to 42.00
Unstripped motor blocks	27.00 to 28.00
No. 1 machinery cast.	42.00 to 44.00
Charging box cast.	35.00 to 36.00

* Corrected quotation for Jan. 25

Cleveland

No. 1 hvy. melting	$33.50 to $34.50
No. 2 hvy. melting	30.00 to 31.00
No. 1 bundles	33.50 to 34.50
No. 2 bundles	27.00 to 28.00
No. 1 busheling	33.50 to 34.50
Machine shop turn.	18.00 to 19.00
Mixed bor. and turn.	23.00 to 24.00
Shoveling turnings	23.00 to 24.00
Cast iron borings	23.00 to 24.00
Cut struct'r'l & plates, 2 ft & under	37.00 to 38.00
Drop forge flashings	33.00 to 34.00
Low phos. punch'gs, plate	33.50 to 34.50
Foundry steel, 2 ft & under	37.00 to 38.00
No. 1 RR. heavy melting	34.00 to 35.00
Rails 2 ft and under	47.00 to 48.00
Rails 18 in. and under	49.00 to 50.00
Railroad grate bars	27.00 to 28.00
Steel axle turnings	27.00 to 28.00
Railroad cast.	.... 45.00
No. 1 machinery cast.	44.00 to 45.00
Stove plate	38.00 to 39.00
Malleable	.... 44.00

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Youngstown

No. 1 hvy. melting	$36.00 to $37.00
No. 2 hvy. melting	33.00 to 33.00
No. 1 bundles	36.00 to 37.00
No. 2 bundles	27.50 to 28.50
Machine shop turn.	20.00 to 21.00
Shoveling turnings	24.00 to 25.00
Cast iron borings	24.00 to 25.00
Low phos. plate	36.00 to 37.00

Buffalo

No. 1 hvy. melting	$30.00 to $31.00
No. 2 hvy. melting	27.50 to 28.50
No. 1 busheling	30.00 to 31.00
No. 1 bundles	30.00 to 31.00
No. 2 bundles	25.50 to 26.50
Machine shop turn.	.... 18.50
Mixed bor. and turn.	.... 20.50
Shoveling turnings	.... 21.50
Cast iron borings	.... 20.50
Low phos. plate	33.50 to 34.50
Scrap rails, random lgth.	35.00 to 36.00
Rails 2 ft and under	42.00 to 43.00
RR. steel wheels	36.00 to 37.00
RR. spring steel	36.00 to 37.00
RR. couplers and knuckles	36.00 to 37.00
No. 1 machinery cast.	41.00 to 42.00
No. 1 cupola cast.	36.00 to 37.00

Detroit

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$28.50 to $29.50
No. 2 hvy. melting	23.00 to 23.00
No. 1 bundles, openhearth	28.50 to 29.50
No. 2 bundles	20.00 to 21.00
New busheling	27.00 to 28.00
Drop forge flashings	27.00 to 28.00
Machine shop turn.	12.00 to 13.00
Mixed bor. and turn.	15.00 to 16.00
Shoveling turnings	16.00 to 17.00
Cast iron borings	16.00 to 17.00
Low phos. punch'gs, plate	28.50 to 29.50
No. 1 cupola cast.	.... 34.00
Heavy breakable cast.	.... 25.00
Stove plate	.... 30.00
Automotive cast.	.... 38.00

St. Louis

No. 1 hvy. melting	$31.00 to $32.00
No. 2 hvy. melting	29.00 to 30.00
No. 1 bundles	30.00 to 31.00
No. 2 bundles	24.50 to 25.50
Machine shop turn.	15.50 to 16.50
Cast. iron borings	15.50 to 16.50
Shoveling turnings	17.00 to 18.00
No. 1 RR. hvy. melting	34.00 to 35.00
Rails, random lengths	39.00 to 40.00
Rails, 18 in. and under	45.50 to 46.50
Locomotive tires, uncut	33.50 to 34.50
Angles and splice bars	33.50 to 34.50
Std. steel car axles	34.50 to 35.50
RR. spring steel	37.00 to 38.00
Cupola cast.	42.00 to 43.00
Hvy. breakable cast.	33.00 to 34.00
Cast iron brake shoes	29.00 to 30.00
Stove plate	34.00 to 35.00
Cast iron car wheels	34.50 to 35.50
Malleable	35.00 to 36.00
Unstripped motor blocks	32.50 to 33.50

Boston

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$24.00 to $25.00
No. 2 hvy. melting	20.00 to 21.00
No. 1 bundles	24.00 to 25.00
No. 2 bundles	17.00 to 18.00
No. 1 busheling	24.00 to 25.00
Elec. furnace, 3 ft & under	26.00 to 27.00
Machine shop turn.	9.00 to 10.00
Mixed bor. and short turn.	9.00 to 10.00
Shoveling turnings	10.00 to 11.00
Clean cast chem. borings	18.00 to 19.00
No. 1 machinery cast.	29.00 to 30.00
Mixed cupola cast.	26.00 to 27.00
Heavy breakable cast.	26.00 to 26.50
Stove plate	25.00 to 26.00
Unstripped motor blocks	18.00 to 19.00

New York

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$29.00 to $30.00
No. 2 hvy. melting	26.50 to 27.50
No. 2 bundles	22.50 to 23.50
Machine shop turn.	10.00 to 11.00
Mixed bor. and turn.	11.00 to 12.00
Shoveling turnings	13.00 to 14.00
Clean cast chem. borings	22.00 to 23.00
No. 1 machinery cast.	35.00 to 36.00
Mixed yard cast.	29.00 to 30.00
Charging box cast.	29.00 to 30.00
Heavy breakable cast.	28.00 to 29.00
Unstripped motor blocks	22.00 to 23.00

Birmingham

No. 1 hvy. melting	$28.00 to $29.00
No. 2 hvy. melting	24.00 to 25.00
No. 1 bundles	28.00 to 29.00
No. 2 bundles	19.00 to 20.00
No. 1 busheling	23.00 to 24.00
Machine shop turn.	15.00 to 16.00
Shoveling turnings	16.00 to 17.00
Cast iron borings	15.00 to 16.00
Electric furnace bundles	29.00 to 30.00
Bar crops and plate	33.00 to 34.00
Structural and plate, 2 ft.	33.00 to 34.00
No. 1 RR. hvy. melting	32.00 to 33.00
Scrap rails, random lgth.	37.00 to 38.00
Rails, 18 in. and under	41.00 to 42.00
Angles & splice bars	38.00 to 39.00
Rerolling rails	42.00 to 43.00
No. 1 cupola cast.	45.00 to 46.00
Stove plate	42.00 to 43.00
Charging box cast.	22.00 to 23.00
Cast iron car wheels	33.00 to 34.00
Unstripped motor blocks	35.50 to 36.50
Mashed tin cans	15.00 to 16.00

Cincinnati

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$31.00 to $32.00
No. 2 hvy. melting	26.00 to 27.00
No. 1 bundles	31.00 to 32.00
No. 2 bundles	22.00 to 23.00
Machine shop turn.	16.00 to 17.00
Mixed bor. and turn.	18.00 to 19.00
Shoveling turnings	19.00 to 20.00
Cast iron borings	18.00 to 19.00
Low phos., 18 in. & under.	36.00 to 37.00
Rails, random lengths	39.00 to 40.00
Rails, 18 in. and under	47.00 to 48.00
No. 1 cupola cast.	39.00 to 40.00
Hvy. breakable cast.	34.00 to 35.00
Drop broken cast.	44.00 to 45.00

San Francisco

No. 1 hvy. melting	.... $24.00
No. 2 hvy. melting	.... 20.00
No. 1 bundles	.... 23.00
No. 2 bundles	.... 18.00
No. 3 bundles	.... 14.00
Machine shop turn.	.... 6.00
Cast iron borings	.... 9.00
No. 1 RR. hvy. melting	.... 24.00
No. 1 cupola cast.	.... 40.00

Los Angeles

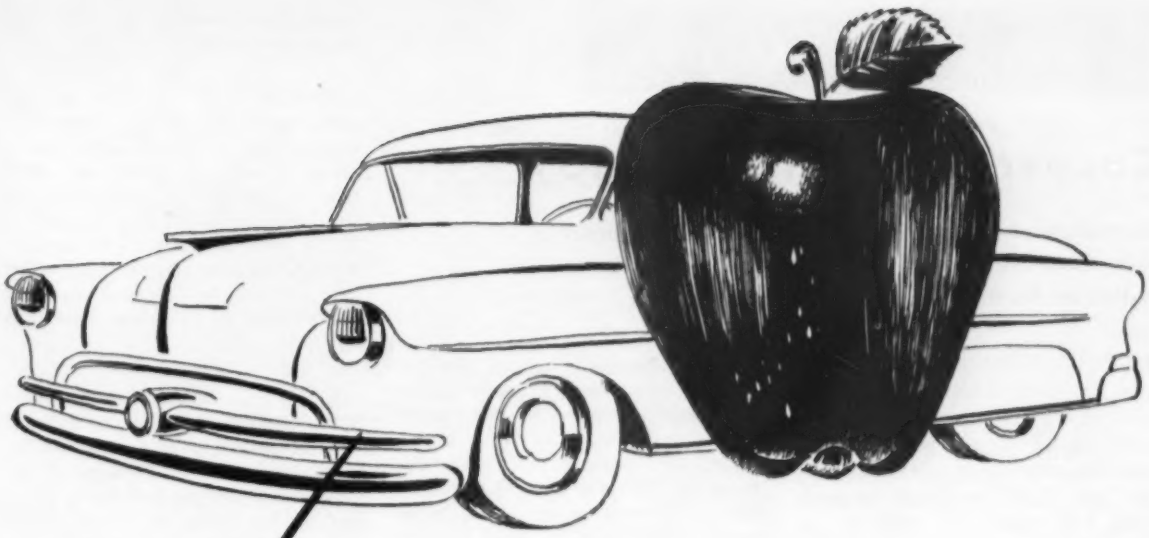
No. 1 hvy. melting	.... $25.00
No. 2 hvy. melting	.... 24.00
No. 1 bundles	.... 27.00
No. 2 bundles	.... 22.00
No. 3 bundles	.... 18.00
Machine shop turn.	.... 8.00
Shoveling turnings	.... 10.00
Cast iron borings	.... 10.00
Elec. furn. 1 ft. and under.	.... 28.00
No. 1 RR. hvy. melting	.... 28.00
No. 1 cupola cast.	.... 42.00

Seattle

No. 1 hvy. melting	.... $29.00
No. 2 hvy. melting	.... 25.00
No. 1 bundles	.... 21.00
No. 2 bundles	.... 18.00
No. 3 bundles	.... 14.00
No. 1 cupola cast.	.... 35.00
Mixed yard cast.	.... 35.00

Hamilton, Ont.

No. 1 hvy. melting	.... $28.00
No. 2 hvy. melting	.... 25.00
No. 1 bundles	.... 28.00
No. 2 bundles	.... 23.00
Mixed steel scrap	.... 22.00
Bushelings	.... 23.00
Bush., new fact prep'd	.... 26.00
Bush., new fact unprep'd	.... 22.00
Short steel turnings	.... 12.00
Mixed bor. and turn.	.... 12.00
Rails, rerolling	.... 37.00
Cast scrap	$42.00 to 45.00



from apples to automobiles

The laws of gravitation have undergone little change since their formulation, but Sir Isaac Newton's carriage to be driven by steam power, conceived by him in 1680, bears little resemblance to today's automotive carriage.

The beginnings of the vast automobile industry might be dated from 1895, when George B. Selden, of Rochester, obtained his patent covering the idea of "applying an internal combustion engine to the propulsion of a vehicle." . . . In 1928 the automobile industry, for the first time in history, became the major consumer of finished rolled steel.

To supply the present vastly expanded needs of the automotive industry and all other civilian and military demands for steel—a continuous movement of scrap must be maintained.

For the purchase

or sale of

iron or steel scrap

. . . phone or write

"Your Chicago Broker"

M. S.
KAPLAN
COMPANY

231 S. La Salle St., Chicago

Telephone ANdover 3-3900

Copper Price Lifted to 33¢

Anaconda leads off in 3¢ hike . . . Scrap, remelt, brass mill prices also rise . . . Zinc strong, price may rise . . . Tin bullish on Formosa situation—*By R. L. Hatschek.*

◆ COPPER PRICES finally gave way last week to the extreme pressure of current circumstances and went up 3¢ to 33¢ per lb. The pressure stems from curtailed supply and high consumer demand (See THE IRON AGE, Jan. 27, p. 114).

With prices leading the nonferrous news so far this year, the trade does not discount the possibility that zinc may be next in line for a hike.

COPPER . . . In a not unexpected move, Anaconda Copper Mining Co. last week lifted its quotation for electrolytic copper to 33.00¢ per lb. The 3¢ boost was quickly followed by custom smelters and some of the other producers. Some other major factors did not make their moves effective until Jan. 31 and Feb. 1, with the effect that a 3¢ spread appears in some daily quotations. This was completely eliminated as of the first of February.

Brass mill and copper wire mill prices jumped immediately led off by Anaconda's fabricating subsidiaries, American Brass Co. and Anaconda Wire & Cable Co.

Other immediate actions precipitated by the rise in primary copper were increases in copper and copper alloy scrap prices at all levels of the trade and increases in secondary brass and bronze by some of the ingot makers. It is specifically noted, however, that some of the ingot makers did not follow, stating that the last increase was sufficient to cover the copper boost.

ALUMINUM . . . General feeling at last week's Aluminum Assn. annual meeting was that the 1954 production record won't stand through '55. Adding the recent government announcement that stockpiling this year may be lower than last makes it fairly certain that the domestic supply picture will be better.

Quick restoration of power is expected for Aluminum Co. of Canada's Kitimat smelter. Power line was knocked out last week by a snowslide in the mountains. Unofficial reports indicate there is enough power available to keep the pots from freezing so that no extensive startup time will be required once the power lines are repaired. Production loss is said to be about 200 tons a day and it's expected that downtime will total only about two weeks.

MAGNESIUM . . . Final 1954 figures from the Magnesium Assn. show a production decline to 4788 tons of primary ingot in December (4942 tons in November). This puts the 1954 total at 69,723 tons as against 93,075 tons in 1953. December wrought product shipments were 836 tons (621 tons in November) to bring the '54 total to 6946 tons (8443 tons in 1953).

LEAD . . . Domestic lead market is definitely perking up with many buyers keeping up an active pace for the past two weeks. Recovery of the London market late last week, which pushed the price to slightly over parity with New York quotations, is helping the tone of the domestic market. Another factor is the jump in copper prices which had the effect of stimulating other metals as well.

ZINC . . . Prices for zinc on the London Metal Exchange last week were definitely strong with a rise to approximately 0.7¢ per lb higher than the New York equivalent price. Consumer demand continues heavy and no one in the trade is ruling out the possibility that there might be a price hike soon.

NICKEL . . . Office of Defense Mobilization is relaxing a bit on nickel, crediting both reduced military needs and the current supply situation with permitting a bonus for civilian users. General Services Administration will take 2 million lb less for stockpile in the current quarter, making it available for industrial buyers.

TIN . . . Increasing bullishness in tin prices results primarily from world tensions centered on the Formosa situation. With the major source of world supply situated in Asia, tin is ever sensitive to the political ebb and flow in the Far East.

India last week added its 29 consuming votes to the ratifiers of the International Tin Agreement. Totals for the agreement now stand at 237 consuming votes (333 required) and 631 producing votes (900 required). At least two more consumer nations must ratify and, of the producers, Indonesia and one other must sign in order to bring the vote totals high enough for final acceptance of the Tin Agreement.

Daily Nonferrous Metal Prices

(Cents per lb except as noted)

	Jan. 26	Jan. 27	Jan. 28	Jan. 29	Jan. 31	Feb. 1
Copper, electro, Conn.	30.00	30.00	30.00- 33.00	30.00- 33.00	30.00- 33.00	33.00
Copper, Lake, delivered	30.00	30.00	30.00	30.00	30.00	33.00
Tin, Straits, New York	88.50	88.50	89.625	....	90.25	90.25*
Zinc, East St. Louis	11.50	11.50	11.50	11.50	11.50	11.50
Lead, St. Louis	14.80	14.80	14.80	14.80	14.80	14.80

Note: Quotations are going prices **Tentative*

Monthly Average Metal Prices

(Cents per lb except as noted)

Average prices of the major nonferrous metals in January, based on quotations appearing in THE IRON AGE, were as follows:

Electrolytic copper,		Zinc, E. St. Louis	11.50
Del'd Conn. Valley	30.173	Zinc, New York	12.00
Lake copper, delivered	30.00	Lead, St. Louis	14.80
Straits tin, New York	87.280	Lead, New York	15.00

MILL PRODUCTS

(Cents per lb, unless otherwise noted)

Aluminum

(Base 30,000 lb, f.o.b. ship. pt., frt. allowed)

Alloy	Flat Sheet			Plate
	0.032 in.	0.081 in.	0.136-0.249 in.	0.250-3.000 in.
1100, 3003	39.1	37.1	35.9	35.5
3004	44.0	39.8	38.1	37.6
5052	46.7	41.9	40.2	39.3
2024-O, -OAL	49.4	40.8	39.3	39.4
7075-O, -OAL	60.8	49.1	46.8	46.8

Extruded Solid Shapes: Shape factors 1 to 6, 38.7¢ to 86.7¢; 12 to 14, 39.4¢ to $1.04; 24 to 26, 42.2¢ to $1.35; 36 to 38, 49.8¢ to $1.97.

Rod, Round: Rolled, 1.064-4-5 in. 1100-F, 43.8¢ to 40.1¢; cold finished, 0.375-3.499 in., 1100-F, 47.9¢ to 42.4¢.

Screw Machine Stock: Rounds, 2011-T3, ¼-11/32 in., 63.5¢ to 50.1¢; ⅝-1½ in., 49.9¢ to 46.9¢; 1 9/16-3 in., 45.7¢ to 42.7¢. Base 5000 lb.

Drawn Wire: Coiled, 0.051-0.374 in., 1100, 47.1¢ to 35.8¢; 5052, 56.7¢ to 44.4¢; 2017-T4, 64.3¢ to 44.7¢; 6061-T4, 59.5¢ to 44.1¢.

Extruded Tubing: Rounds, 6063-T6, OD 1¼-2 in., 44.4¢ to 64.8¢; 2-4 in., 40.3¢ to 54.6¢; 4-6 in., 40.8¢ to 49.8¢; 6-9 in., 41.4¢ to 52.1¢.

Roofing Sheet: Flat, per sheet, 0.052-in., 42¾ x 60-in., $2.998; x 96-in., $4.801; x 120-in., $6.002; x 144-in., $7.202. Coiled sheet, per lb, 0.019 in. x 28 in., 30.9¢.

Magnesium

(F.o.b. mill, freight allowed)

Sheet & Plate: FS1-O ¼ in., 56¢; 3/16 in., 67¢; ½ in., 60¢; 0.064 in., 73¢; 0.032 in., 94¢. Specification grade higher. Base 30,000 lb.

Extruded Round Rod: M, diam ¼ to 0.311 in., 77¢; ½ to ¾ in., 60.5¢; 1¼ to 1.749 in., 56¢; 2⅛ to 5 in., 51.5¢. Other alloys higher. Base up to ⅝ in. diam, 10,000 lb; ¾ to 2 in., 20,000 lb; 2 in. and larger, 30,000 lb.

Extruded Solid Shapes: Rectangles: M. In weight per ft for perimeters less than size indicated: 0.10 to 0.11 lb, 3.5 in., 65.3¢; 0.22 to 0.25 lb, 5.9 in., 62.3¢; 0.50 to 0.59 lb, 8.6 in., 59.7¢; 1.8 to 2.59 lb, 19.5 in., 56.8¢; 4 to 6 lb, 28 in., 52¢. Other alloys higher. Base, in weight per ft of shape: Up to ½ lb, 10,000 lb; ½ to 1.80 lb, 20,000 lb; 1.80 lb and heavier, 30,000 lb.

Extruded Round Tubing: M, 0.049 to 0.057 in. wall thickness: OD ⅜ to 5/16 in., $1.43; 5/16 to ⅝ in., $1.29; ½ to ⅝ in., 96¢; 1 to 2 in., 79¢; 0.165 to 0.219 in. wall: OD, ⅝ to ¾ in., 64¢; 1 to 2 in., 60¢; 3 to 4 in., 59¢. Other alloys higher. Base, OD: Up to 1½ in., 10,000 lb; 1⅛ to 3 in., 20,000 lb; over 3 in., 30,000 lb.

Titanium

(10,000 lb base, f.o.b. mill)

Commercially pure and alloy grades: Sheets and strip, HR or CR, $15; Plate, HR, $12; Wire, rolled and/or drawn, $11; Bar, HR or forged, $9; Forgings, $9.

Nickel, Monel, Inconel

(Base prices, f.o.b. mill)

	"A" Nickel	Monel	Inconel
Sheet, CR	102	78	99
Strip, CR	102	87	125
Rod, Bar, HR	87	69	93
Angles, HR	87	69	93
Plate, HR	97	82	95
Seamless Tube	122	108	153
Shot, Blocks		65	

Copper, Brass, Bronze

(Freight included on 500 lb)

	Sheet	Rods	Extruded Shapes
Copper	49.79		51.86
Copper, h-r	51.76	48.11	
Copper, drawn			
Low brass	47.35	47.29	
Yellow brass	44.27	44.21	
Red brass	48.44	48.38	
Naval brass			
Leaded brass			
Com. bronze	50.08	50.02	
Mang. bronze			
Phos. bronze	70.12		
Muntz metal			
Ni silver, 10 pct			

Beryllium copper, CR, 1.9% Be, Base 2000 lb, f.o.b.
Strip $1.63
Rod, bar, wire 1.65

PRIMARY METALS

(Cents per lb, unless otherwise noted)

Aluminum ingot, 99+%, 10,000 lb, freight allowed 23.30
Aluminum pig 21.50
Antimony, American, Laredo, Tex. 28.50
Beryllium copper, per lb cont'd be. $40.00
Beryllium aluminum 5% Be, Dollars per lb contained Be $72.75
Bismuth, ton lots $2.25
Cadmium, del'd $1.70
Cobalt, 97-99% (per lb) ..... $2.60 to $2.67
Copper, electro, Conn. Valley 23.00
Copper, Lake, delivered 23.00
Gold, U. S. Treas., per troy oz. $35.00
Indium, 99.8%, dollars per troy oz. $3.25
Iridium, dollars per troy oz. $110 to $120
Lead, St. Louis 14.80
Lead, New York 15.00
Magnesium, 99.8+%, f.o.b. Freeport, Tex., 10,000 lb, pig 27.00
ingot 27.75
Magnesium, sticks, 100 to 500 lb, 46.00 to 48.00
Mercury, dollars per 76-lb flask, f.o.b. New York ..... $322 to $324
Nickel electro, f.o.b. N. Y. warehouse 67.67
Nickel oxide sinter, at Copper Cliff, Ont., contained nickel 60.75
Palladium, dollars per troy oz. $18 to $20
Platinum, dollars per troy oz. $82 to $84
Silver, New York, cents per troy oz. 85.25
Tin, New York 90.25
Titanium, sponge, grade A-1 ..... $4.50
Zinc, East St. Louis 11.50
Zinc, New York 12.00
Zirconium copper, 50 pct $6.20

REMELTED METALS

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5-5 ingot
No. 115 ..... 31.50-33.00
No. 120 ..... 31.00-32.50
No. 123 ..... 30.50-32.00
80-10-10 ingot
No. 305 ..... 35.50-37.00
No. 315 ..... 33.25-34.75
88-10-2 ingot
No. 210 ..... 44.25-45.75
No. 215 ..... 40.75-42.25
No. 245 ..... 36.25-37.75
Yellow ingot
No. 405 ..... 27.25-28.75
Manganese bronze
No. 421 ..... 29.25-30.75

Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)

95-5 aluminum-silicon alloys
0.30 copper, max. 25.75-26.50
0.60 copper, max. 25.50-26.25
Piston alloys (No. 122 type) 25.75-26.75
No. 12 alum. (No. 2 grade) 24.50-24.75
108 alloy 24.50-25.25
195 alloy 25.50-26.00
13 alloy (0.60 copper max.) 25.50-26.25
ASX-679 ..... 24.50-25.25

Steel deoxidizing aluminum, notch-bar granulated or shot

Grade 1—96-97½% 25.50-26.50
Grade 2—92-96% 24.50-25.50
Grade 3—90-92% 23.50-24.50
Grade 4—85-90% 22.50-23.50

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, freight allowed, 5000 lb lots)

Copper
Cast, oval, 15 in. or longer 44.92
Electrodeposited 29.78
Flat rolled 45.42
Brass, 80-20
Cast, oval, 15 in. or longer 42.515
Zinc, flat cast 20.25
Ball, anodes 18.50
Nickel, 99 pct plus
Cast 90.50*
Cadmium $1.70
Silver 999 fine, rolled, 100 oz. lots per troy oz., f.o.b. Bridgeport, Conn. 94⅛

Chemicals

(Cents per lb, f.o.b. shipping points)

Copper cyanide, 100 lb drum 63.00
Copper sulphate, 99.5 crystals, bbl. 12.85
Nickel salts, single or double, 4-100 lb bags, frt. allowed 31.25*
Nickel chloride, 300 to 400 lb 43.50*
Silver cyanide, 100 oz. lots, per oz. 75½
Sodium cyanide, 96 pct domestic 200 lb drums 19.25
Zinc cyanide, 100 lb drum 54.30
*Effective Jan. 3.

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)

	Heavy	Turnings
Copper	29	28¼
Yellow brass	21¾	20¼
Red brass	25⅛	22⅝
Comm. bronze	26⅛	25⅞
Mang. bronze		
Yellow brass rod ends	21⅝	

Custom Smelters' Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire 31½
No. 2 copper wire 30
Light copper 28½
*Refinery brass 27⅛
* Dry copper content.

Ingot Makers Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire ..... 30½—31
No. 2 copper wire ..... 29 —29½
Light copper ..... 27½—28
No. 1 composition ..... 25½—26
No. 1 comp. turnings ..... 25 —25½
Rolled brass ..... 19¾—20¼
Brass pipe 20¼
Radiators ..... 20½—20¾
Aluminum
Mixed old cast ..... 15¾—16¾
Mixed new clips ..... 17½—18
Mixed turnings, dry ..... 16 —17
Pots and pans ..... 15¾—16¾

Dealers' Scrap

(Dealers' buying price, f.o.b. New York in cents per pound)

Copper and Brass

No. 1 heavy copper and wire 28¾—29¼
No. 2 heavy copper and wire 27½—27¾
Light copper ..... 26¼—26¾
New type shell cuttings ..... 25¼—25⅝
Auto radiators (unsweated) 18½
No. 1 composition ..... 22½—23
No. 1 composition turnings 22 —22½
Unlined red car boxes 19
Cocks and faucets 19
Mixed heavy yellow brass 16
Old rolled brass 18
Brass pipe 19
New soft brass clippings 21
Brass rod ends 19
No. 1 brass rod turnings 18

Aluminum

Alum. pistons and struts 9½
Aluminum crankcases 12
1100 (2S) aluminum clippings 15½
Old sheet and utensils 12
Borings and turnings ..... 7½— 8½
Misc. cast aluminum 12
2024 (24S) clippings 13½

Zinc

New zinc clippings 7
Old zinc 5½
Zinc routings ..... 3½— 3¾
Old die cast scrap ..... 3¼— 3⅜

Nickel and Monel

Pure nickel clippings 57
Clean nickel turnings 40
Nickel anodes 57
Nickel rod ends 57
New Monel clippings 28
Clean Monel turnings 21
Old sheet Monel 26
Nickel silver clippings, mixed 16½
Nickel silver turnings, mixed 13⅝

Lead

Soft scrap lead ..... 13 —13¼
Battery plates (dry) ..... 6¾— 6⅞
Batteries, acid free ..... 4.35— 4.60

Magnesium

Segregated solids ..... 18½—19
Castings ..... 17½—18

Miscellaneous

Block tin ..... 70 —75
No. 1 pewter ..... 50 —55
No. 1 auto babbitt 46
Mixed common babbitt ..... 13 —13⅛
Solder joints 17
Siphon tops 45
Small foundry type ..... 16½—16⅝
Monotype ..... 15 —15⅛
Lino. and stereotype ..... 14½—14⅝
Electrotype ..... 13½—13⅝
Hand picked type shells ..... 10¾—10⅞
Lino. and stereo. dross 6¼
Electro dross 5

IRON AGE

STEEL PRICES

(Effective Feb. 1, 1958)

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BILLETS, BLOOMS, SLABS			PILING	SHAPES STRUCTURALS			STRIP					
		Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton	Sheet Steel	Carbon	Hi Str. Low Alloy	Carbon Wide-Flange	Hot-rolled	Cold-rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot-rolled	Alloy Cold-rolled
EAST	Bethlehem, Pa.			$86.00 *B3*		4.30 *B3*	6.45 *B3*	4.30 *B3*						
	Buffalo, N. Y.	$64.00 *B3*	$78.00 *B3, R3*	$86.00 *B3, R3*	5.075 *B3*	4.30 *B3*	6.45 *B3*	4.30 *B3*	4.05 *B3,R3*	5.75 *B3,R7*	6.15 *B3*	8.425 *B3*		
	Claymont, Del.													
	Centreville, Pa.													
	Conshohocken, Pa.								4.10 *A2*	5.80 *A2*	6.15 *A2*			
	New Bedford, Mass.									6.20 *R6*				
	Johnstown, Pa.	$64.00 *B3*	$78.00 *B3*	$86.00 *B3*		4.30 *B3*	6.45 *B3*		4.05 *B3*					
	Fairless, Pa.													
	New Haven, Conn.									6.20 *D1* 6.50 *A5*				
	Phoenixville, Pa.					3.95 *P2*		3.95 *P2*						
	Sparrows Pt., Md.								4.05 *B3*	5.75 *B3*	6.15 *B3*	8.425 *B3*		
	Wallingford, Conn.									6.20 *W1*				
	Pawtucket, R. I. Worcester, Mass.									6.30 *N7* 6.60 *A5*				12.75 *A5* 12.80 *N7*
MIDDLE WEST	Alton, Ill.								4.225 *L1*					
	Ashland, Ky.								4.05 *A7*					
	Canton-Massillon, Dover, Ohio		$80.00 *R3*	$86.00 *R3, T5*										12.45 *G4*
	Chicago, Ill.	$64.00 *U1*	$78.00 *R3, U1,W8*	$86.00 *U1, W8,R3*	5.075 *U1*	4.25 *U1, W8*	6.40 *U1, Y1*	4.25 *U1*	4.05 *A1,N4 W8*	5.85 *A1*				
	Cleveland, Ohio									5.75 *A5,J3*		8.60 *A5*		12.45 *A5*
	Detroit, Mich.			$86.00 *R5*					4.15 *G3,M2*	5.85 *D1,D2, G3,M2,P11*	6.25 *G3*	8.70 *D2, G3*		
	Duluth, Minn.													
	Gary, Ind. Harbor, Indiana	$64.00 *U1*	$78.00 *U1*	$86.00 *U1, Y1*	5.075 *I3*	4.25 *I3, U1*	6.40 *U1, I3*		4.05 *I3, U1,Y1*	5.85 *I3*	6.15 *U1, I3,Y1*	8.60 *Y1*	6.70 *U1, Y1*	
	Sterling, Ill.								4.15 *N4*					
	Indianapolis, Ind.									5.90 *C5*				
	Newport, Ky.												6.70 *Y3*	
	Middletown, Ohio									5.75 *A7*				
	Niles, Warren, Ohio Sharon, Pa.								4.05 *S1,R3*	5.75 *S1,R3, T4*	6.15 *S1, R3*	8.60 *S1, R3*	6.70 *S1*	12.45 *S1*
	Pittsburgh, Pa. Midland, Pa. Butler, Pa.	$64.00 *U1, J3*	$78.00 *J3, U1,C11*	$86.00 *U1, C11*	5.075 *U1*	4.25 *J3, U1*	6.40 *J3, U1*	4.25 *U1*	4.05 *S7,P6*	5.75 *B4,J3, S7*			6.70 *S9*	12.45 *S9*
	Portsmouth, Ohio								4.05 *P7*	5.75 *P7*				
	Weirton, Wheeling, Follansbee, W. Va.					4.25 *W3*			4.05 *W3*	5.75 *F3,W3*	6.15 *W3*	8.60 *W3*		
	Youngstown, Ohio		$78.00 *C10*	$86.00 *Y1, C10*		4.25 *Y1*	6.40 *Y1*		4.05 *U1,Y1*	5.75 *Y1,C5*	6.15 *U1, Y1*	8.60 *Y1*	6.70 *U1, Y1*	12.45 *C5*
WEST	Fontana, Cal.	$72.00 *K1*	$86.00 *K1*	$105.00 *K1*		4.90 *K1*	7.05 *K1*	5.25 *K1*	4.825 *K1*	7.65 *K1*	7.25 *K1*		8.10 *K1*	14.55 *K1*
	Geneva, Utah		$78.00 *C7*			4.25 *C7*	6.40 *C7*							
	Kansas City, Mo.					4.30 *S2*	6.45 *S2*		4.30 *S2*		6.40 *S2*		6.95 *S2*	
	Los Angeles, Torrance, Cal.		$87.50 *B2*	$106.00 *B2*		4.95 *B2, C7*	7.10 *B2*		4.80 *B2,C7*	7.80 *C1*				
	Minnequa, Colo.					4.70 *C6*			5.15 *C6*					
	Portland, Ore.					5.00 *O2*								
	San Francisco, Niles, Pittsburg, Cal.		$87.50 *B2*			4.90 *B2* 4.95 *P9*	7.05 *B2*		4.80 *B2,C7*					
	Seattle, Wash.		$91.50 *B2*			5.00 *B2*	7.15 *B2*		5.05 *B2, P12*					
SOUTH	Atlanta, Ga.								4.25 *A8*					
	Fairfield, Ala. City, Birmingham, Ala.	$64.00 *T2*	$78.00 *T2*			4.25 *C16, R5,T3*	6.40 *T2*		4.05 *R3, T2,C16*		6.15 *T2*			
	Houston, Tex.		$83.00 *S2*	$91.00 *S2*		4.30 *S2*	6.45 *S2*		4.30 *S2*		6.40 *S2*		6.95 *S2*	

IRON AGE

STEEL PRICES

(Effective Feb. 1, 1955)

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		SHEETS									WIRE ROD	TINPLATE†		BLACK PLATE
		Hot-rolled 18 ga. & heavier	Cold-rolled	Galvanized 10 ga.	Enameling 12 ga.	Long Terne 10 ga.	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.	Hot-rolled 19 ga.		Coke* 1.25-lb. base box	Electro* 0.25-lb. base box	Hollowware Enameling 29 ga.
EAST	Bethlehem, Pa.													
	Buffalo, N. Y.	4.05 *B3*	4.95 *B3*				6.10 *B3*	7.50 *B3*			4.675 *W6*	† Special coated mfg. terne deduct 95¢ from 1.25-lb coke base box price. Can-making quality blackplate 55 to 128 lb. deduct $2.20 from 1.25-lb. coke base box. * COKES: 1.50-lb. add 25¢. ELECTRO: 0.50-lb. add 25¢; 0.75-lb. add 65¢; 1.00-lb. add $1.10. Differential 1.00 lb./0.25 lb. add 85¢.		
	Claymont, Del.													
	Coatesville, Pa.													
	Conshohocken, Pa.	4.10 *A2*	5.00 *A2*				6.15 *A2*							
	Harrisburg, Pa.													
	Hartford, Conn.													
	Johnstown, Pa.										4.675 *B3*			
	Fairless, Pa.	4.10 *U1*	5.00 *U1*				6.15 *U1*	7.55 *U1*				$8.90 *U1*	$7.60 *U1*	
	New Haven, Conn.													
	Phoenixville, Pa.													
	Sparrows Pt., Md.	4.05 *B3*	4.95 *B3*	5.45 *B3*			6.10 *B3*	7.50 *B3*	8.20 *B3*		4.775 *B3*	$8.90 *B3*	$7.60 *B3*	
	Worcester, Mass.										4.975 *A5*			
	Trenton, N. J.													
MIDDLE WEST	Alton, Ill.										4.85 *L1*			
	Ashland, Ky.	4.05 *A7*		5.45 *A7*	5.375 *A7*									
	Canton-Massillon, Dover, Ohio			5.45 *R1,R3*						5.175 *R1*				
	Chicago, Joliet, Ill.	4.05 *A1, W8*					6.10 *U1*				4.675 *A5, N4,R3*			
	Sterling, Ill.										4.775 *N4*			
	Cleveland, Ohio	4.05 *J3, R3*	4.95 *J3, R3*		5.375 *R3*		6.10 *J3, R3*	7.50 *J3, R3*			4.675 *A5*			
	Detroit, Mich.	4.15 *G3, M2*	5.05 *G3*				6.20 *G3*	7.60 *G3*						
	Newport, Ky.	4.05 *N5*		5.45 *N5*										
	Gary, Ind. Harbar, Indiana	4.05 *I3, U1,Y1*	4.95 *I3, U1,Y1*	5.45 *U1, I3*	5.375 *I3, U1*	5.85 *U1*	6.10 *U1, I3,Y1*	7.50 *U1, Y1*			4.675 *Y1*	$8.80 *I3, U1,Y1*	$7.50 *I3, U1,Y1*	6.20 *U1, Y1*
	Granite City, Ill.	4.25 *G2*	5.15 *G2*	5.65 *G2*	5.575 *G2*								$7.60 *G2*	6.30 *G2*
	Kokomo, Ind.	4.15 *C9*		5.55 *C9*						5.20 *C9*	4.775 *C9*			
	Mansfield, Ohio					5.85 *E2*				5.175 *E2*				
	Middletown, Ohio		4.95 *A7*		5.375 *A7*	5.85 *A7*								
	Niles, Ohio Sharon, Pa.	4.05 *S1,R3* 5.30 *N3*	4.95 *R3* 5.975 *N3*	5.45 *N3*	6.725 *N3*	5.85 *N3*	6.10 *S1,R3*	7.50 *R3*				$8.80 *R3*	$7.50 *R3*	
	Pittsburgh, Pa. Midland, Pa. Butler, Pa.	4.05 *J3, U1,P6*	4.95 *J3, U1,P6*	5.45 *U1*	5.375 *U1*		6.10 *J3, U1*	7.50 *J3, U1*	8.20 *U1*		4.675 *A5* 4.875 *P6*	$8.80 *J3, U1*	$7.50 *J3, U1*	6.20 *U1*
	Portsmouth, Ohio	4.05 *P7*	4.95 *P7*								4.675 *P7*			
	Weirton, Wheeling, Follansbee, W. Va.	4.05 *W3, W5*	4.95 *W3, W5,F3*	5.45 *W3, W5*		5.85 *W3, W5*	6.10 *W3*	7.50 *W3*				$8.80 *W3, W5*	$7.50 *W3, W5*	6.20 *F3, W5*
	Youngstown, Ohio	4.05 *U1, Y1*	4.95 *Y1*		5.375 *Y1*		6.10 *U1, Y1*	7.50 *Y1*			4.675 *Y1*			
WEST	Fontana, Cal.	4.825 *K1*	6.05 *K1*				6.875 *K1*	8.55 *K1*			5.475 *K1*			
	Geneva, Utah	4.15 *C7*												
	Kansas City, Mo.										4.925 *S2*			
	Los Angeles, Torrance, Cal.										5.475 *C7, B2*			
	Minnequa, Colo.										4.925 *C6*			
	San Francisco, Niles, Pittsburg, Cal.	4.75 *C7*	5.90 *C7*	6.20 *C7*							5.325 *C7*	$9.55 *C7*	$8.25 *C7*	
	Seattle, Wash.													
SOUTH	Atlanta, Ga.													
	Fairfield, Ala. Alabama City, Ala.	4.05 *R3, T2*	4.95 *T2*	5.45 *R3, T2*			6.10 *T2*			5.35 *R3*	4.675 *T2, R3*	$8.90 *T2*	$7.60 *T2*	
	Houston, Texas										4.925 *S2*			

STEEL PRICES

(Effective Feb. 1, 1955)

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BARS						PLATES				WIRE
		Carbon Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfgr's. Bright
EAST	Bethlehem, Pa.				5.075 *B3*	6.625 *B3*	6.45 *B3*					
	Buffalo, N. Y.	4.30 *B3,R3*	4.30 *B3,R3*	5.45 *B5*	5.075 *B3,R3*	6.625 *B3,B5*	6.45 *B3*	4.225 *B3,R3*			6.45 *B3*	5.75 *W6*
	Claymont, Del.							4.225 *C4*		5.80 *C4*		
	Coatesville, Pa.							4.225 *L4*		5.80 *L4*		
	Conshohocken, Pa.							4.225 *A2*	5.275 *A2*		6.45 *A2*	
	Harrisburg, Pa.							3.975 *C3*	5.275 *C3*			
	Hartford, Conn.			5.90 *R3*		6.925 *R3*						
	Johnstown, Pa.	4.30 *B3*	4.30 *B3*		5.075 *B3*		6.45 *B3*	4.225 *B3*		5.80 *B3*	6.45 *B3*	5.75 *B3*
	Fairless, Pa.	4.45 *U1*	4.45 *U1*		5.225 *U1*							
	Newark, N. J.			5.85 *W10*		6.80 *W10*						
	Camden, N. J.			5.85 *P10*								
	Putnam, Conn.			5.95 *W10*								
	Sparrows Pt., Md.		4.30 *B3*					4.225 *B3*		5.80 *B3*	6.45 *B3*	5.85 *B3*
	Palmer, Worcester, Readville, Mansfield, Mass.			5.85 *W11* 5.95 *B5,C14*		6.925 *A5,B5*						6.05 *A5, W6*
MIDDLE WEST	Alton, Ill.	4.50 *L1*										5.925 *L1*
	Ashland, Newport, Ky.							4.225 *A7,N5*		5.80 *N5*		
	Canton-Massillon, Mansfield, Ohio	4.40 *R3*		5.40 *R2,R3*	5.075 *R3,T5*	6.625 *R2,R3, T5*		4.225 *E2*				
	Chicago, Joliet, Ill.	4.30 *U1, N4,W8,R3*	4.30 *N4,R3*	5.40 *A5,W10, W8,B5,L2*	5.075 *U1,R3, W8*	6.625 *A5,W8, W10,L2,B5*		4.225 *U1,W8, I3,A1,R3*	5.275 *U1*	5.80 *U1*	6.45 *U1*	5.75 *A5, R3,N4,W7*
	Cleveland, Ohio	4.30 *R3*	4.30 *R3*	5.40 *A5,C13*		6.825 *A5* 6.665 *C13*	6.45 *R3*	4.225 *J3,R3*	5.275 *J3*		6.45 *J3,R3*	5.75 *A5, C13*
	Detroit, Mich.	4.40 *G3* 4.45 *R5*		5.40 *R5* 5.60 *B5,P8* 5.65 *P3*	5.075 *R5* 5.175 *G3*	6.825 *R5* 6.825 *B5,P3, P8*	6.55 *G3*	4.325 *G3*			6.55 *G3*	
	Duluth, Minn.											5.75 *A5*
	Gary, Ind. Harbor, Crawfordsville	4.30 *I3, U1, Y1*	4.30 *I3, U1, Y1*	5.40 *M5,R3*	5.075 *I3, U1, Y1*	6.525 *M5* 6.625 *R3*	6.45 *U1, I3, Y1*	4.225 *I3, U1, Y1*	5.275 *I3*	5.80 *U1, Y1*	6.45 *U1, I3, Y1*	5.85 *M4*
	Granite City, Ill.							4.425 *G2*				
	Kokomo, Ind.											5.85 *C9*
	Sterling, Ill.	4.40 *N4*	4.40 *N4*									5.85 *N4*
	Niles, Ohio Sharon, Pa.	4.30 *R3*					6.45 *R3*	4.225 *S1,R3*		5.80 *S1*	6.45 *S1*	
	Pittsburgh, Pa. Midland, Pa.	4.30 *J3, U1, C11*	4.30 *J3, U1*	5.40 *A5,C8, C11,J3, W10,B4,R3*	5.075 *U1,C11*	6.625 *A5,C11, W10,C8,R3*	6.45 *J3, U1*	4.225 *J3, U1*	5.275 *U1*	5.80 *U1*	6.45 *J3, U1*	5.75 *A5,J3, P6*
	Portsmouth, Ohio											5.75 *P7*
	Weirton, Wheeling, Follansbee, W. Va.	4.30 *W5*						4.225 *W3, W5*				
	Youngstown, Ohio	4.30 *U1, Y1, C10,R3*	4.30 *U1, Y1, R3*	5.40 *F2, Y1, C10*	5.075 *U1, Y1, C10*	6.625 *Y1,C10* 6.665 *F2*	6.45 *U1, Y1*	4.225 *U1, Y1, R3*		5.80 *Y1*	6.45 *Y1*	5.75 *Y1*
WEST	Emeryville, Cal.	5.05 *J5*	5.05 *J5*									
	Fontana, Cal.	5.00 *K1*	5.00 *K1*		6.125 *K1*		7.70 *K1*	4.875 *K1*		6.45 *K1*	7.15 *K1*	
	Geneva, Utah							4.225 *C7*			6.45 *C7*	
	Kansas City, Mo.	4.55 *S2*	4.55 *S2*		5.325 *S2*		6.70 *S2*					6.00 *S2*
	Los Angeles, Torrance, Cal.	5.00 *B2,C7*	5.00 *B2,C7*	6.05 *R3*	6.125 *B2*		7.15 *B2*					6.70 *B2*
	Minnequa, Colo.	4.75 *C6*	4.75 *C6*					5.075 *C6*				6.00 *C6*
	Portland, Ore.	5.05 *O2*	5.05 *O2*									
	San Francisco, Niles, Pittsburg, Cal.	5.00 *C7,P9* 5.05 *B2*	5.00 *C7,P9* 5.05 *B2*				7.20 *B2*					6.70 *C7*
	Seattle, Wash.	5.05 *B2,P12, N6*	5.05 *B2,P12*				7.20 *B2*	5.125 *B2*		6.70 *B2*	7.35 *B2*	
SOUTH	Atlanta, Ga.	4.50 *A8*	4.50 *A8*									5.95 *A8*
	Fairfield, Ala. City, Birmingham, Ala.	4.30 *T2,C16, R3*	4.30 *T2,C16, R3*				6.45 *T2*	4.225 *T2,R3*			6.45 *T2*	5.75 *R3, T2*
	Houston, Ft. Worth, Lone Star, Tex.	4.55 *S3*	4.55 *S2*		5.325 *S2*		6.70 *S2*	4.55 *L3* 4.275 *S2*		5.85 *S2*	6.50 *S2*	6.00 *S2*

Key to Steel Producers

With Principal Offices

A1 Acme Steel Co., Chicago
A2 Alan Wood Steel Co., Conshohocken, Pa.
A3 Allegheny Ludlum Steel Corp., Pittsburgh
A4 American Cladmetals Co., Carnegie, Pa.
A5 American Steel & Wire Div., Cleveland
A6 Angell Nail & Chaplet Co., Cleveland
A7 Armco Steel Corp., Middletown, O.
A8 Atlantic Steel Co., Atlanta, Ga.

B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.
B2 Bethlehem Pacific Coast Steel Corp., San Francisco
B3 Bethlehem Steel Co., Bethlehem, Pa.
B4 Blair Strip Steel Co., New Castle, Pa.
B5 Bliss & Laughlin, Inc., Harvey, Ill.

C1 Calstrip Steel Corp., Los Angeles
C2 Carpenter Steel Co., Reading, Pa.
C3 Central Iron & Steel Co., Harrisburg, Pa.
C4 Claymont Products Dept., Claymont, Del.
C5 Cold Metal Products Co., Youngstown, O.
C6 Colorado Fuel & Iron Corp., Denver
C7 Columbia Geneva Steel Div., San Francisco
C8 Columbia Steel & Shafting Co., Pittsburgh
C9 Continental Steel Corp., Kokomo, Ind.
C10 Copperweld Steel Co., Pittsburgh, Pa.
C11 Crucible Steel Co. of America, New York
C12 Cumberland Steel Co., Cumberland, Md.
C13 Cuyahoga Steel & Wire Co., Cleveland
C14 Compressed Steel Shafting Co., Readville, Mass.
C15 G. O. Carlson, Inc., Thorndale, Pa.
C16 Connors Steel Div., Birmingham

D1 Detroit Steel Corp., Detroit
D2 Detroit Tube & Steel Div., Detroit
D3 Driver Harris Co., Harrison, N. J.
D4 Dickson Weatherproof Nail Co., Evanston, Ill.

E1 Eastern Stainless Steel Corp., Baltimore
E2 Empire Steel Co., Mansfield, O.

F1 Firth Sterling, Inc., McKeesport, Pa.
F2 Fitzsimmons Steel Corp., Youngstown
F3 Follansbee Steel Corp., Follansbee, W. Va.

G1 Globe Iron Co., Jackson, O.
G2 Granite City Steel Co., Granite City, Ill.
G3 Great Lakes Steel Corp., Detroit
G4 Greer Steel Co., Dover, O.

H1 Hanna Furnace Corp., Detroit

I2 Ingersoll Steel Div., Chicago
I3 Inland Steel Co., Chicago
I4 Interlake Iron Corp., Cleveland

J1 Jackson Iron & Steel Co., Jackson, O.
J2 Jessop Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh
J4 Joslyn Mfg. & Supply Co., Chicago
J5 Judson Steel Corp., Emeryville, Calif.

K1 Kaiser Steel Corp., Fontana, Cal.
K2 Keystone Steel & Wire Co., Peoria
K3 Koppers Co., Granite City, Ill.

L1 Laclede Steel Co., St. Louis
L2 La Salle Steel Co., Chicago
L3 Lone Star Steel Co., Dallas
L4 Lukens Steel Co., Coatesville, Pa.

M1 Mahoning Valley Steel Co., Niles, O.
M2 McLouth Steel Corp., Detroit
M3 Mercer Tube & Mfg. Co., Sharon, Pa.
M4 Mid-States Steel & Wire Co., Crawfordsville, Ind.
M5 Monarch Steel Co., Inc., Hammond, Ind.
M6 Mystic Iron Works, Everett, Mass.

N1 National Supply Co., Pittsburgh
N2 National Tube Div., Pittsburgh
N3 Niles Rolling Mill Div., Niles, O.
N4 Northwestern Steel & Wire Co., Sterling, Ill.
N5 Newport Steel Corp., Newport, Ky.
N6 Northwest Steel Rolling Mills, Seattle
N7 Newman Crosby Steel Co., Pawtucket, R. I.

O1 Oliver Iron & Steel Co., Pittsburgh
O2 Oregon Steel Mills, Portland

P1 Page Steel & Wire Div., Monessen, Pa.
P2 Phoenix Iron & Steel Co., Phoenixville, Pa.
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
P4 Pittsburgh Coke & Chemical Co., Pittsburgh
P5 Pittsburgh Screw & Bolt Co., Pittsburgh
P6 Pittsburgh Steel Co., Pittsburgh
P7 Portsmouth Div., Detroit Steel Corp., Detroit
P8 Plymouth Steel Co., Detroit
P9 Pacific States Steel Co., Niles, Cal.
P10 Precision Drawn Steel Co., Camden, N. J.
P11 Production Steel Strip Corp., Detroit
P12 Pacific Steel Rolling Mills, Seattle

R1 Reeves Steel & Mfg. Co., Dover, O.
R2 Reliance Div., Eaton Mfg. Co., Massillon, O.
R3 Republic Steel Corp., Cleveland
R4 Roebling Sons Co., John A., Trenton, N. J.
R5 Rotary Electric Steel Co., Detroit
R6 Rodney Metals, Inc., New Bedford, Mass.
R7 Rome Strip Steel Co., Rome, N. Y.

S1 Sharon Steel Corp., Sharon, Pa.
S2 Sheffield Steel Corp., Kansas City
S3 Shenango Furnace Co., Pittsburgh
S4 Simonds Saw & Steel Co., Fitchburg, Mass.
S5 Sweet's Steel Co., Williamsport, Pa.
S6 Standard Forging Corp., Chicago
S7 Stanley Works, New Britain, Conn.
S8 Superior Drawn Steel Co., Monaca, Pa.
S9 Superior Steel Corp., Carnegie, Pa.

T1 Tonawanda Iron Div., N. Tonawanda, N. Y.
T2 Tennessee Coal & Iron Div., Fairfield
T3 Tennessee Products & Chem. Corp., Nashville
T4 Thomas Strip Div., Warren, O.
T5 Timken Steel & Tube Div., Canton, O.
T6 Tremont Nail Co., Wareham, Mass.
T7 Texas Steel Co., Fort Worth

U1 United States Steel Corp., Pittsburgh
U2 Universal-Cyclops Steel Corp., Bridgeville, Pa.
U3 Ulbrich Stainless Steels, Wallingford, Conn.
U4 U. S. Pipe & Foundry Co., Birmingham

W1 Wallingford Steel Co., Wallingford, Conn.
W2 Washington Steel Corp., Washington, Pa.
W3 Weirton Steel Co., Weirton, W. Va.
W4 Wheatland Tube Co., Wheatland, Pa.
W5 Wheeling Steel Corp., Wheeling, W. Va.
W6 Wickwire Spencer Steel Div., Buffalo
W7 Wilson Steel & Wire Co., Chicago
W8 Wisconsin Steel Co., S. Chicago, Ill.
W9 Woodward Iron Co., Woodward, Ala.
W10 Wyckoff Steel Co., Pittsburgh
W11 Worcester Pressed Steel Co., Worcester, Mass.

Y1 Youngstown Sheet & Tube Co., Youngstown

PIPE AND TUBING

Base discounts (pct) f.o.b. mills. Base price about $280 per net ton.

	BUTTWELD														SEAMLESS							
	½ In.		¾ In.		1 In.		1¼ In.		1½ In.		2 In.		2½–3 In.		2 In.		2½ In.		3 In.		3½–4 In.	
	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
STANDARD T. & C.																						
Sparrows Pt. *B3*	21.75	6.5	24.75	10.5	27.25	14.0	29.75	14.75	30.25	15.75	30.75	16.25	32.25	16.0	.....	.....	.....	.....	.....	.....	.....	.....
Youngstown *R3*	23.75	8.5	26.75	12.5	29.25	16.0	31.75	16.75	32.25	17.75	32.75	18.25	34.25	18.0	.....	.....	.....	.....	.....	.....	.....	.....
Fontana *K1*	10.75	W4.5	13.75	W0.5	16.25	3.0	18.75	3.75	19.25	4.75	19.75	5.25	21.25	5.0	.....	.....	.....	.....	.....	.....	.....	.....
Pittsburgh *J3*	23.75	8.5	26.75	12.5	29.25	16.0	31.75	16.75	32.25	17.75	32.75	18.25	34.25	18.0	13.5	W1.50	17.5	0.75	20.0	3.25	21.5	4.75
Alton, Ill. *L1*	21.75	6.5	24.75	10.5	27.25	14.0	29.75	14.75	30.25	15.75	30.75	16.25	32.25	16.0	.....	.....	.....	.....	.....	.....	.....	.....
Sharon *M3*	23.75	8.5	26.75	12.5	29.25	16.0	31.75	16.75	32.25	17.75	32.75	18.25	34.25	18.0	.....	.....	.....	.....	.....	.....	.....	.....
Fairless *N2*	21.75	6.5	24.75	10.5	27.25	14.0	29.75	14.75	30.25	15.75	30.75	16.25	32.25	16.0	.....	.....	.....	.....	.....	.....	.....	.....
Pittsburgh *N1*	23.75	8.5	26.75	12.5	29.25	16.0	31.75	16.75	32.25	17.75	32.75	18.25	34.25	18.0	13.5	W1.50	17.5	0.75	20.0	3.25	21.5	4.75
Wheeling *W5*	23.75	8.5	26.75	12.5	29.25	16.0	31.75	16.75	32.25	17.75	32.75	18.25	34.25	18.0	.....	.....	.....	.....	.....	.....	.....	.....
Wheatland *W4*	23.75	8.5	26.75	12.5	29.25	16.0	31.75	16.75	32.25	17.75	32.75	18.25	34.25	18.0	.....	.....	.....	.....	.....	.....	.....	.....
Youngstown *Y1*	23.75	8.5	26.75	12.5	29.25	16.0	31.75	16.75	32.25	17.75	32.75	18.25	34.25	18.0	13.5	W1.50	17.5	0.75	20.0	3.25	21.5	4.75
Indiana Harbor *Y1*	22.75	7.5	25.75	11.5	28.25	15.0	30.75	15.75	31.25	16.75	31.75	17.25	33.25	17.0	.....	.....	.....	.....	.....	.....	.....	.....
Lorain *N2*	23.75	8.5	26.75	12.5	29.25	16.0	31.75	16.75	32.25	17.75	32.75	18.25	34.25	18.0	13.5	W1.50	17.5	0.75	20.0	3.25	21.5	4.75
EXTRA STRONG PLAIN ENDS																						
Sparrows Pt. *B3*	25.25	11.5	29.25	15.5	31.25	19.0	31.75	17.75	32.25	18.75	32.75	19.25	33.25	18.0	.....	.....	.....	.....	.....	.....	.....	.....
Youngstown *R3*	27.25	13.5	31.25	17.5	33.25	21.0	33.75	19.75	34.25	20.75	34.75	21.25	35.25	20.0	.....	.....	.....	.....	.....	.....	.....	.....
Fairless *N2*	25.25	11.5	29.25	15.5	31.25	19.0	31.75	17.75	32.25	18.75	32.75	19.25	33.25	18.0	.....	.....	.....	.....	.....	.....	.....	.....
Fontana *K1*	14.25	.....	18.25	.....	20.25	.....	20.75	.....	21.25	.....	21.75	.....	22.25	.....	.....	.....	.....	.....	.....	.....	.....	.....
Pittsburgh *J3*	27.25	13.5	31.25	17.5	33.25	21.0	33.75	19.75	34.25	20.75	34.75	21.25	35.25	20.0	14.0	.....	19.0	3.25	21.5	5.75	26.5	10.75
Alton, Ill. *L1*	25.25	11.5	29.25	15.5	31.25	19.0	31.75	17.75	32.25	18.25	32.75	19.25	33.25	18.0	.....	.....	.....	.....	.....	.....	.....	.....
Sharon *M3*	27.25	13.5	31.25	17.5	33.25	21.0	33.75	19.75	34.25	20.75	34.75	21.75	35.25	20.0	.....	.....	.....	.....	.....	.....	.....	.....
Pittsburgh *N1*	27.25	13.5	31.25	17.5	33.25	21.0	33.75	19.75	34.25	20.75	34.75	21.75	35.25	20.0	14.0	.....	19.0	3.25	21.5	5.75	26.5	10.75
Wheeling *W5*	27.25	13.5	31.25	17.5	33.25	21.0	33.75	19.75	34.25	20.75	34.75	21.75	35.25	20.0	.....	.....	.....	.....	.....	.....	.....	.....
Wheatland *W4*	27.25	13.5	31.25	17.5	33.25	21.0	33.75	19.75	34.25	20.75	34.75	21.75	35.25	20.0	.....	.....	.....	.....	.....	.....	.....	.....
Youngstown *Y1*	27.25	13.5	31.25	17.5	33.25	21.0	33.75	19.75	34.25	20.75	34.75	21.75	35.25	20.0	14.0	.....	19.0	3.25	21.5	5.75	26.5	10.75
Indiana Harbor *Y1*	26.25	12.5	30.25	16.5	32.25	20.0	32.75	18.75	33.25	19.75	33.75	20.75	34.25	19.0	.....	.....	.....	.....	.....	.....	.....	.....
Lorain *N2*	27.25	13.5	31.25	17.5	33.25	21.0	33.75	19.75	34.25	20.75	34.75	21.75	35.25	20.0	14.0	.....	19.0	3.25	21.5	5.75	26.5	10.

Threads only, buttweld and seamless 2¼ pt. higher discount. Plain ends, buttweld and seamless, 3-in. and under, 4½ pt. higher discount. Buttweld jobbers discount, 5 pct.
Galvanized discounts based on zinc price range of over 9¢ to 11¢ incl. per lb, East St. Louis. For each 2¢ change in zinc, discounts vary as follows: ½, ¾ and 1-in., 2 pt.; 1¼, 1½ and 2-in., 1½ pt.; 2½ and 3-in., 1 pt. e.g., zinc price range of over 11¢ to 13¢ would lower discounts; zinc price in range of over 7¢ to 9¢ would increase discounts. East St. Louis zinc price now 11.50¢ per lb.

Steel Prices

(Effective Feb. 1, 1955)

To identify producers, see Key on preceding page.

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Screw Spikes	Tie Plates	Track Bolts Treated
Bessemer *U1*	4.45	5.35	5.425				
So. Chicago *R3*				7.30			
Ensley *T2*	4.45	5.35					
Fairfield *T2*		5.35		7.30		5.275	
Gary *U1*	4.45	5.35				5.275	
Ind. Harbor *I3*	4.45		5.425	7.30		5.275	
Johnstown *B3*		5.35					
Joliet *U1*		5.35	5.425				
Kansas City *S2*				7.30			11.50
Lackawanna *B3*	4.45	5.35	5.425			5.275	
Minnequa *C6*	4.45	5.35	5.425	7.30		5.275	11.50
Pittsburgh *O1*					11.00		11.50
Pittsburgh *P3*					11.00		11.50
Pittsburgh *J3*				7.30			
Seattle *B2*				7.80		5.425	12.00
Steelton *B3*	4.45		5.425			5.275	
Struthers *Y1*				7.30			
Torrance *C7*						5.425	
Williamsport *S5*		5.35					
Youngstown *R3*				7.30			

ELECTRICAL SHEETS

22-Gage F.o.b. Mill Cents Per Lb	Hot-Rolled (Cut Lengths)*	Cold-Reduced (Coiled or Cut Length) Semi-Processed	Fully Processed
Field	8.025	8.225	
Armature	8.50	8.75	9.25
Elect.	9.10	9.35	9.85
Motor	10.10	10.35	10.85
Dynamo	11.80	11.25	11.75
Trans. 72	11.95	12.20	12.70
Trans. 65	12.50	Grain Oriented	
Trans. 58	13.00	Trans. 80	16.60
Trans. 52	14.00	Trans. 73	17.10

Producing points: Beech Bottom (*W5*); Brackenridge (*A5*); Granite City (*G2*); Indiana Harbor (*I5*); Mansfield (*E2*); Newport, Ky. (*N5*); Niles, O. (*N3*); Vandergrift (*U1*); Warren, O. (*R5*); Zanesville (*A7*).

*Coils 75¢ higher.

CLAD STEEL

Stainless-carbon	Plate	Sheet
No. 304, 20 pct.		
Coatesville, Pa., *L4*	*35.50	
Washington, Pa., *J2*	.....	
Claymont, Del., *C4*	.....	
New Castle, Ind., *I2*	.....	32.50
Nickel-carbon		
10 pct. Coatesville, Pa., *L4*	39.50	
Inconel-carbon		
10 pct., Coatesville, Pa., *L4*	47.90	
Monel-carbon		
10 pct. Coatesville, Pa., *L4*	40.80	

* Includes annealing and pickling, sandblasting.

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard & Coated Nails Col	Woven Wire Fence 9-15½ ga. Col	"T" Fence Posts Col	Single Loop Bale Ties Col	Galv. Barbed and Twisted Barbless Wire ¢/lb.	Merch. Wire Ann'ld ¢/lb.	Merch. Wire* Galv. ¢/lb.
Alabama City *R3*	137	146	...	155	159	6.90	7.30
Aliquippa, Pa. *J3*	137	149	...		156	6.90	7.425
Atlanta *A8*	139	151	...	157	164	7.00	7.525
Bartonsville *K2*	139	151	...	157	164	7.00	7.55
Buffalo *W6*						6.90	7.30
Chicago, Ill. *N4*	137	149	...	155	162	6.90	7.45
Cleveland *A6*	142						
Cleveland *A5*						6.90	
Crawfordsville *M4*	139	151	...	157	159	7.00	7.55
Donora, Pa. *A5*	137	146	...	155	159	6.90	7.30
Duluth *A5*	137	146	150	155	159	6.90	7.30
Fairfield, Ala. *T2*	137	146	...	155	159	6.90	7.30
Galveston *D4*	139						
Houston *S2*	142	154	...		164	7.30	7.70
Johnstown, Pa. *B3*	137	149	...		162	6.90	7.45
Joliet, Ill. *A5*	137	146	...	155	159	6.90	7.30
Kokomo, Ind. *C9*	139	148	...	157	161	7.00	7.55
Los Angeles *B2*						7.85	
Kansas City *S2*	142	158	...	167	164	7.50	7.90
Minnequa *C6*	142	154	155	160	168	7.15	7.55
Monessen *P6*	137	151	...		163	6.90	7.45
Moline, Ill. *R3*			145				
Pittsburg, Cal. *C7*	156	169	...	179	179	7.85	8.25
Portsmouth *P7*						6.90	7.90
Rankin, Pa. *A5*	137	146	...		159	6.90	7.30
So. Chicago *R3*	137	146	145	155	159	6.90	7.30
S. San Francisco *C6*					179		
Sparrows Pt. *B3*	139		...	157	164	7.00	7.55
Struthers, O. *Y1*			...			6.90	7.55
Worcester *A5*	143		...			7.20	
Williamsport, Pa. *S5*			150				

Cut Nails, carloads, base $8.30 per keg at Conshohocken, Pa. (*A2*).

* Alabama City and So. Chicago don't include zinc extra Galvanized products computed with zinc at 11.0¢ per lb

C-R SPRING STEEL

Cents Per Lb F.o.b. Mill	CARBON CONTENT 0.26-0.40	0.41-0.60	0.61-0.80	0.81-1.05	1.06-1.35
Bridgeport, New Britain, Conn. *S7**	5.75	8.05	9.00	11.15	13.85
Buffalo, N. Y. *R7*	5.75	8.05	9.00	10.95	13.25
Carnegie, Pa. *S9*		8.05	9.00	11.15	13.85
Cleveland *A5*	5.75	8.05	9.00	11.15	13.85
Detroit *D1*	5.85	8.25	9.20	10.95	.....
Detroit *D2*	5.85	8.25	9.20	.....	.....
Harrison, N. J. *C11*	.....	.....	9.30	11.45	14.15
Indianapolis *C9*	6.00	8.20	9.00	11.15	13.85
New Castle, Pa. *B4*	5.75	8.05	9.00	10.95	.....
New Haven, Conn. *D1*	6.20	8.35	9.30	11.25	.....
Pawtucket, R. I. *N7*	6.30	8.35	9.30	11.45	14.15
Riverdale, Ill. *A1*	5.85	8.05	9.00	11.15	13.85
Sharon, Pa. *S1*	5.75	8.05	9.00	11.15	13.85
Trenton *R4*	.....	8.35	9.30	11.25	13.40
Wallingford *W1*	6.20	8.35	9.30	11.45	14.15
Warren, Ohio *T4*	5.75	8.05	9.00	11.15	13.85
Weirton, W. Va. *W3*	5.85	8.05	9.00	10.95	13.25
Worcester, Mass. *A5*	6.00	8.35	9.30	11.45	14.15
Youngstown *C3*	5.85	8.05	9.00	11.15	13.85

* Sold on Pittsburgh base.

BOILER TUBES

$ per 100 ft. carload lots, cut 10 to 24 ft. F.o.b. Mill	Size OD-In.	Size B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.	Elec. Weld C.D.
Babcock & Wilcox	2	13	28.33	33.97	27.48	32.95
	2½	12	38.15	45.74	37.00	44.36
	3	12	44.05	52.82	42.72	51.23
	3½	11	51.43	61.66	49.88	59.81
	4	10	66.29	81.88	66.24	79.42
National Tube	2	13	28.33	33.97	27.48	.....
	2½	12	38.15	45.74	37.00	.....
	3	12	44.05	52.82	42.72	.....
	3½	11	51.43	61.66	49.88	.....
	4	10	66.29	81.88	66.24	.....
Pittsburgh Steel	2	13	28.33	33.97	.....	.....
	2½	12	38.15	45.74	.....	.....
	3	12	44.05	52.82	.....	.....
	3½	11	51.43	61.66	.....	.....
	4	10	66.29	81.88	.....	.....

WAREHOUSES

Base price, f.o.b., dollars per 100 lb.

Cities	City Delivery Charge	Sheets: Hot-Rolled	Sheets: Cold-Rolled (15 gage)	Sheets: Galvanized (10 gage)	Strip: Hot-Rolled	Strip: Cold-Rolled	Plates	Shapes: Standard Structural	Bars: Hot-Rolled	Bars: Cold-Finished	Alloy Bars: As rolled A 4615 As rolled	Alloy Bars: Hot-Rolled A 4140 Annealed	Alloy Bars: Cold-Drawn A 4615 As rolled	Alloy Bars: Cold-Drawn A 4140 Annealed
Baltimore	$.20	6.22	7.51	7.78	6.89	.....	6.57	6.92	6.66	8.52	.....	.....	.....	.....
Birmingham	.15	6.35–6.50	7.35–8.10	8.25–9.00	6.00	9.00	6.65	6.65	6.50	9.00	.....	.....	.....	.....
Boston	.10	7.23	8.23	9.42–9.52	7.47	9.65–9.85	7.34–7.37	7.49	7.29	8.66–8.70	12.60–12.80	12.45–12.46	15.15	15.10
Buffalo	.20	6.35–6.40	7.40[3] 7.45	8.60–8.84	6.70–6.75	.....	6.65–6.70	6.70–6.77	6.50–6.55	7.85[3] 7.90	12.50	12.15	[3] 14.85	14.75 14.80[3]
Chicago	.20	6.38	7.38	8.30	6.62	.....	6.52	6.69	6.51	7.50	12.25	11.90	14.60	14.55
Cincinnati	.15	6.49–6.53	17.37–7.42	8.25–8.30	6.86–6.91	.....	6.81–6.86	6.91	6.75–6.80	7.80–7.85	12.55	12.15–12.20	14.90	14.80–14.85
Cleveland	.20	6.35	7.38	8.45	6.72	.....	6.69	7.02	6.57	7.60	11.96	.....	.....	14.61
Denver		8.15	9.15	10.37	8.40	.....	8.10	8.15	8.30	9.27	.....	.....	.....	16.30
Detroit	.20	6.57	7.57	8.50–8.58	6.90	.....	6.88–6.85	7.16	6.79	7.77	12.45	12.10	14.80	14.75
Houston	.20	7.35	7.80	9.03	7.70	.....	7.35	7.60	7.70	9.50	.....	13.10	.....	.....
Kansas City	.20	7.05	8.05	8.95	7.29	.....	7.19	7.36	7.16	8.07–8.27	.....	12.27	.....	.....
Los Angeles	.20	7.50	9.35	9.95	7.85	.....	7.45	7.65	7.45	10.15	.....	13.20	.....	16.35
Memphis	.10	6.79	7.69	.....	6.90	.....	7.01	7.09	6.85	8.24	.....	.....	.....	.....
Milwaukee	.20	6.47	7.47	8.21–8.30	6.71	.....	6.61	6.86	6.60	7.69	12.34	11.99	14.69	14.64–14.84
New Orleans	.15	6.70	7.65	9.23	6.80	.....	6.90–6.95	7.05	6.80	8.70–10.70	.....	.....	.....	.....
New York	.10	6.97–6.98	7.78–8.46	8.79[1] 8.99	7.36–7.56	.....	7.18–7.27	7.13–7.38	7.30–7.37	8.63–8.73[3]	12.63	12.28	.....	14.93
Norfolk	.20	7.00	.....	.....	7.10	.....	7.10	7.10	7.10	8.60	.....	.....	.....	.....
Philadelphia	.10	6.19	7.29[3]	8.09[4] 8.23	6.94	.....	6.49	6.54	6.74	8.19[3]	.....	11.66–12.21	.....	14.86
Pittsburgh	.20	6.38	7.38	8.30–8.50	6.72–6.75	.....	6.52	6.69	6.51	7.85	12.25	11.90	14.60	14.55
Portland	.20	7.60	9.75	9.05	7.85	.....	7.45	7.50	7.55	10.95	.....	.....	.....	.....
Salt Lake City	.20	7.65	10.20	10.70	9.05	.....	7.70	7.70–8.65	8.00	10.95	.....	.....	.....	.....
San Francisco	.20	7.55	8.95	9.35–9.85	7.80	.....	7.40	7.50	7.35	10.05	.....	13.20	.....	16.35
Seattle	.80	8.10	9.80	10.15	8.20	.....	7.80	7.75	7.80	10.95	.....	13.65	.....	16.30
St. Louis	.20	6.62–6.67	7.67	8.54–8.59	6.91	.....	6.81	7.09	6.90	7.89	12.54	12.19	14.84–14.89	14.45–14.84
St. Paul	.15	7.03	8.03–8.56	8.96	7.28	.....	7.19	7.35	7.16	8.26	.....	12.56	.....	15.21

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 9999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may not be combined with each other or with galvanized sheets for quantity.

Exceptions: (1) 1500 to 9999 lb. (2) 1000 lb or over. (3) $.25 delivery. (4) 1000 to 1999 lb, $.25 delivery.

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	per lb
18	4	1	—	—	$1.54
18	4	1	—	5	2.245
18	4	2	—	—	1.705
1.5	4	1.5	8	—	.90
6	4	2	6	—	1.29

High-carbon chromium	.73
Oil hardened manganese	.405
Special carbon	.37
Extra carbon	.31
Regular carbon	.26

Warehouse prices on and east of Mississippi are 3.5¢ per lb higher. West of Mississippi, 5.5¢ higher.

CAST IRON WATER PIPE

	Per Net Ton
6 to 24-in., del'd Chicago	$111.80 to $115.30
6 to 24 in., del'd N. Y.	115.00 to 116.00
6 to 24-in., Birmingham	98.00 to 102.50
6-in. and larger f.o.b. cars, San Francisco, Los Angeles, for all rail shipments; rail and water shipments less	$129.50 to $131.50

Class "A" and gas pipe, $5 extra; 4-in. pipe is $5 a ton above 6-in.

LAKE SUPERIOR ORES

51.50% Fe; natural content, delivered lower Lake ports. Prices effective July 1, 1953, to end of 1954 season.

	Gross Ton
Openhearth lump	$11.15
Old range, bessemer	10.30
Old range, nonbessemer	10.15
Mesabi, bessemer	10.05
Mesabi, nonbessemer	9.90
High phosphorus	9.90

Prices based on upper Lakes rail freight rates, Lake vessel freight rates, handling and unloading charges, and taxes thereon, in effect on June 24, 1953. Increases or decreases after such date are for buyer's account.

COKE

	Net-Ton
Furnace, beehive (f.o.b. oven) Connellsville, Pa.	$14.25 to $14.50
Foundry, beehive (f.o.b. oven) Connellsville, Pa.	$16.50 to $17.00
Foundry, oven coke	
Buffalo, del'd	$28.08
Chicago, f.o.b.	24.50
Detroit, f.o.b.	25.50
New England, del'd	26.05
Seaboard, N. J., f.o.b.	24.00
Philadelphia, f.o.b.	23.00
Swedeland, Pa., f.o.b.	23.00
Painesville, Ohio, f.o.b.	25.50
Erie, Pa., f.o.b.	25.00
Cleveland, del'd	27.43
Cincinnati, del'd	26.56
St. Paul, f.o.b.	23.75
St. Louis, f.o.b.	26.00
Birmingham, f.o.b.	22.65
Lone Star, Tex., f.o.b.	18.50

ELECTRODES

Cents per lb, f.o.b. plant, threaded, with nipples, unboxed.

GRAPHITE			CARBON		
Diam. (in.)	Length (in.)	Price	Diam. (in.)	Length (in.)	Price
24	84	20.80	40	100, 110	8.95
20	72	20.00	35	110	8.95
12 to 18	72	20.80	30	110	8.95
7 to 10	60	21.00	24	72 to 84	9.10
6	60	23.25	20	90	8.95
4	40	25.80	17	72	9.10
3	40	27.25	14	72	8.80
2½	30	28.80	10, 12	60	10.30
2	24	43.80	8	60	10.80

BOLTS, NUTS, RIVETS, SCREWS

(Base discount, f.o.b. mill)

Machine and Carriage Bolts

	Discount Less Case	C.
½ in. & smaller x 4 in. & shorter	2	22
½ in. & smaller x 6 in. & shorter	+3	18
9/16 in. & ⅝ in. x 6 in. & shorter	+4	17
¾ in. & larger x 6 in. & shorter	+6	15
All diam. longer than 6 in.	+15	8
½ in. & smaller x 6 in. & shorter	+3	18
Lag, all diam. x 6 in. & shorter	6	25
Lag, all diam. longer than 6 in.	+2	19
Plow bolts	23	23

Nuts, H.P., C.P., reg. & hvy.

	Base Discount	Discount, Case or Keg
¾" or smaller	55	64
⅞" to 1¼" inclusive	58	66
1⅜" to 1½" inclusive	60	67½

C.P. Hex regular & hvy.

All sizes	55	64

Hot Galv. Nuts (all types)

¾" or smaller	38	50
⅞" to 1½" inclusive	41	52½

Finished, Semi-finished, Slotted or Castellated Nuts

All sizes	55	66

Rivets

	Base per 100 lb
½ in. & larger	$9.25
	Pct Off List
7/16 in. and smaller	37

Cap Screws

	Discount Bright	H.C. Heat Treated
New std. hex head, packaged		
⅝" x 6" and smaller and shorter	38	28
¾", ⅞", 1" x 6" and shorter	15	1
New std. hex head, bulk*		
5" x 6" and smaller and shorter	50	43
¾", ⅞", 1" x 6" and shorter	32	21

* Minimum quantity per item:
15,000 pieces ¼", 5/16", ⅜" diam.
5,000 pieces 7/16", ½", 9/16", ⅝" diam.
2,000 pieces ¾", ⅞", 1" diam.

Machine Screws & Stove Bolts

		Discount Mach. Screws	Stove Bolts
Packaged, package list		33	43
Bulk, bulk list	Quantity		
¼-in. diam. & under	15,000- 99,999	59	17
	100,000-199,999	63	25
	200,000 & over	67	33
5/16-in. diam. & larger	15,000- 49,999	59	17
	50,000- 99,999	63	25
	100,000 & over	67	33
All diam. over 3 in. long	5,000- 49,999	59	..
	50,000- 99,999	63	..
	100,000 & over	67	..

Machine Screw & Stove Bolt Nuts

		Discount Hex	Square
Packaged, package list		30	33
Bulk, bulk list	Quantity		
⅜-in. diam. & smaller	15,000- 99,999	15	17
	100,000-199,999	23	25
	200,000 & over	31	33

REFRACTORIES

Fire Clay Brick

	Carloads per 1000
First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add $5.00)	$114.00
No. 1 Ohio	107.00
Sec. quality, Pa., Md., Ky., Mo., Ill.	107.00
No. 2 Ohio	98.00
Ground fire clay, net ton, bulk (except Salina, Pa., add $1.50)	17.00

Silica Brick

Mt. Union, Pa., Ensley, Ala.	$120.00
Childs, Hays, Pa.	125.00
Chicago District	130.00
Western Utah	.....
California	.....
Super Duty Hays, Pa., Athens, Tex., Windham	137.00
Curtner, Calif.	155.00
Silica cement, net ton, bulk, Eastern (except Hays, Pa.)	20.00
Silica cement, net ton, bulk, Hays, Pa.	22.00
Silica cement, net ton, bulk, Chicago District, Ensley, Ala.	21.00
Silica cement, net ton, bulk, Utah and Calif.	.....

Chrome Brick

	Per net ton
Standard chemically bonded, Balt.	$86.00
Standards chemically bonded, Curtner, Calif.	96.25
Burned, Balt.	80.00

Magnesite Brick

Standard Baltimore	$109.00
Chemically bonded, Baltimore	97.50

Grain Magnesite

	St. ⅝-in. grains
Domestic, f.o.b. Baltimore in bulk fines removed	$64.40
Domestic, f.o.b. Chewalah, Wash., Luning, Nev. in bulk	38.00
in sacks	43.75

Dead Burned Dolomite

	Per net ton
F.o.b. bulk, producing points in: Pa., W. Va., Ohio	$14.50
Midwest	15.10
Missouri Valley	13.65

FLUORSPAR

Washed gravel, f.o.b. Rosiclaire, Ill.

Price, net ton; effective CaF₂ content	
72½%	$44.00
70% or more	42.50
60% or less	38.00

METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh.

Swedish sponge iron c.l.f. New York, ocean bags	11.25¢
Canadian sponge iron, Del'd in East	12.0¢
F.o.b. ship. pt., carloads	9.5¢
Domestic sponge iron, 98+% Fe, carload lots	9.5¢
Electrolytic iron, annealed, 99.5+% Fe	38.0¢
Electrolytic iron, unannealed, minus 325 mesh, 99+% Fe	53.5¢
Hydrogen reduced iron minus 300 mesh, 98+% Fe	63.0¢ to 80.0¢
Carbonyl iron, size 5 to 10 micron, 98%, 00.8+% Fe	83.0¢ to $1.48
Aluminum	31.5¢
Brass, 10 ton lots	29.50¢ to 36.50¢
Copper, electrolytic	43.50¢
Copper, reduced	43.50¢
Cadmium, 100-199 lb. 95¢ plus metal value	
Chromium, electrolytic, 99% min., and quality, del'd	$3.60
Lead	21.00¢
Manganese	57.0¢
Molybdenum, 99%	$2.75
Nickel, unannealed	89.50¢
Nickel, annealed	96.50¢
Nickel, spherical, unannealed	93.50¢
Silicon	43.50¢
Solder powder	7.0¢ to 9.0¢ plus met. value
Stainless steel, 302	91.0¢
Stainless steel, 316	$1.10
Tin	14.0¢ plus metal value
Tungsten, 99% (65 mesh)	$4.05
Zinc, 10 ton lots	17.5¢ to 25.0¢

Ferroalloy Prices

(Effective Feb. 1, 1955)

Ferrochrome

Contract prices, cents per lb contained Cr, lump, bulk, carloads, del'd, 65-72% Cr, 2% max Si.

0.025% C ..	36.00	0.15% C ...	33.75
0.025% C, Simplex ..	34.50	0.20% C ...	33.50
		0.50% C ...	33.25
0.06% C ...	34.50	1.00% C ...	33.00
0.10% C ...	34.00	2.00% C ...	32.75
65-69% Cr, 4-9% C			34.75
62-66 Cr, 4-6% C, 6.9% Si			35.60

S. M. Ferrochrome

Contract prices, cents per pound, chromium contained, lump size, delivered.

High carbon type: 60.65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.

Carloads	25.85
Ton lots	28.00
Less ton lots	29.50

High Nitrogen Ferrochrome

Low-carbon type 67-72% Cr, 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome price schedule. Add 3¢ for each additional 0.25% of N.

Chromium Metal

Contract prices, per lb chromium contained, packed, delivered, ton lots, 97% min. Cr, 1% max. Fe.

0.10 max. C	$1.18
0.50% max. C	1.16
9 to 11% C	1.25

Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-49%, C 0.05% max.) Contract price, carloads, f.o.b. Niagara Falls, freight allowed, lump 4-in. x down, 24.75¢ per lb contained Cr plus 12.00¢ per lb contained Si. Bulk 2-in. x down, 25.05¢ per lb contained Cr plus 10.80¢ per lb contained Si. Bulk 1-in. x down, 25.25¢ per lb contained Cr plus 11.00¢ per lb contained Si.

Calcium-Silicon

Contract price per lb of alloy, lump, delivered.

30-33% Cr, 60-65% Si, 3.00 max. Fe.

Carloads	19.00
Ton lots	22.10
Less ton lots	23.60

Calcium-Manganese—Silicon

Contract prices, cents per lb of alloy, lump, delivered.

16-20% Ca, 14-18% Mn, 53-59% Si.

Carloads	20.00
Ton lots	22.30
Less ton lots	23.30

SMZ

Contract prices, cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe ⅛ in. x 12 mesh.

Ton lots	17.50
Less ton lots	19.50

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, V-5; 38-42% Cr, 17-19% Si, 8-11% Mn, packed.

Carload lots	16.60
Ton lots	18.10
Less ton lots	19.35

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.

Carload packed	17.50
Ton lots to carload packed	18.50
Less ton lots	20.00

Ferromanganese

Maximum contract base price, f.o.b., lump size, base content 74 to 76 pct Mn; Producing Point — Cents per-lb

Marietta, Ashtabula, O.; Alloy, W. Va.; Sheffield, Ala.; Portland, Ore.	9.50
Clairton, Pa.	9.50
Sheridan, Pa.	9.50
Philo, Ohio	9.50

Add or subtract 0.1¢ for each 1 pct Mn above or below base content.

Briquets, delivered, 66 pct Mn:

Carloads, bulk	11.85
Ton lots packed	13.65

Spiegeleisen

Contract prices, per gross ton, lump, f.o.b. Palmerton, Pa.

Manganese	Silicon	
16 to 19%	3% max.	$84.00
19 to 21%	3% max.	86.00
21 to 23%	3% max.	88.50
23 to 25%	3% max.	91.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.

95.50% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.

Carload, packed	45.00
Ton lots	48.50

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, f.o.b. Marietta, O., delivered, cents per pound.

Carloads	30.00
Ton lots	32.00
250 to 1999 lb	34.00
Premium for hydrogen-removed metal	0.75

Medium Carbon Ferromanganese

Mn 80% to 85%, C 1.25 to 1.50. Contract price, carloads, lump, bulk, delivered, per lb of contained Mn ..... 21.25¢

Low-Carb Ferromanganese

Contract price, cents per pound Mn contained, lump size, del'd Mn 85-90%.

	Carloads	Ton	Less
0.07% max. C, 0.06% P, 90% Mn	32.00	33.85	35.05
0.07% max. C	29.95	31.80	33.80
0.15% max. C	28.45	30.30	31.50
0.30% max. C	26.95	28.80	30.00
0.50% max. C	26.45	28.30	29.50
0.75% max. C, 80-85% Mn, 5.0-7.0% Si	23.45	25.30	26.50

Silicomanganese

Contract basis, lump size, cents per pound of metal, delivered, 65-68% Mo, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.2¢.

Carload bulk	11.00
Ton lots	12.65
Briquet contract basis carlots, bulk, delivered, per lb of briquet	12.45
Ton lots, packed	14.25

Silvery Iron (electric furnace)

Si 14.01 to 14.50 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., $85.00 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., $88.00. Add $1.00 per ton for each additional 0.50% Si up to and including 17%. Add $1.45 for each 0.50% Mn over 1%.

Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, packed.

	Ton lots	Carloads
96% Si, 2% Fe	20.10	18.00
97% Si, 1% Fe	20.60	18.50

Silicon Briquets

Contract price, cents per pound of briquets, bulk, delivered, 40% Si, 2 lb Si briquets.

Carloads, bulk	6.55
Ton lots	8.35

Electric Ferrosilicon

Contract price, cents per lb contained Si, lump, bulk, carloads, delivered.

25% Si	20.00	75% Si	14.40
50% Si	12.00	85% Si	16.10
65% Si	13.50	90% Si	17.25

Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.

	Cast	Turnings	Distilled
Ton lots	$2.05	$2.95	$3.75
Less ton lots	2.40	3.30	4.55

Ferrovanadium

35-55% contract, basis, delivered, per pound, contained V.

Openhearth	$3.00-$3.10
Crucible	3.10- 3.20
High speed steel (Primos)	3.20- 3.25

Alsifer, 20% Al, 40% Si, 40% Fe,

Contract basis, f.o.b. Suspension Bridge, N. Y., per lb.

Carloads	9.25¢
Ton lots	10.15

Calcium molybdate, 46.3-46.6%

f.o.b. Langeloth, Pa., per pound contained Mo $1.28

Ferrocolumbium, 50-60%, 2 in.

x D contract basis, delivered per pound contained Cb.

Ton lots	$12.00
Less ton lots	12.65

Ferro-tantalum-columbium, 20%

Ta, 40% Cb, 0.30% C, contract basis, del'd, ton lots, 2-in. x D per lb cont'd Cb plus Ta.... $6.35

Ferromolybdenum, 55-75%, 200-lb

containers, f.o.b. Langeloth, Pa., per pound contained Mo.. $1.46

Ferrophosphorus, electric, 23-

26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., $4.00 unitage, per gross ton $90.00
10 tons to less carload $110.00

Ferrotitanium, 40% regular grade,

0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti $1.35

Ferrotitanium, 25% low carbon,

0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti $1.50
Less ton lots $1.55

Ferrotitanium, 15 to 18% high

carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload, per net ton $177.00

Ferrotungsten, ¼ x down,

packed, per pound contained W. ton lots, f.o.b. $3.80

Molybdic oxide, briquets, per lb

contained Mo, f.o.b. Langeloth, Pa. $1.27
bags, f.o.b. Washington, Pa., Langeloth, Pa. $1.24

Simanal, 20% Si, 20% Mn, 20%

Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per lb.

Carload, bulk, lump	15.50¢
Ton lots, packed lump	16.75¢
Less ton lots, lump, packed	17.25¢

Vanadium Pentoxide, 86 - 89%

V_2O_5 contract basis, per pound contained V_2O_5 ..... $1.23

Zirconium, contract basis, per lb

of alloy.

35-40%, f.o.b. freight allowed, ton lots	26.00¢
12-15%, del'd, lump, bulk-carloads	8.00¢

Boron Agents

Borosil, contract prices per lb of

alloy del. f.o.b. Philo, Ohio, freight allowed. B, 14-4%, Si, 40-45%, per lb contained B.... $5.25

Bortam, f.o.b. Niagara Falls

Ton lots, per pound	45¢
Less ton lots, per pound	50¢

Corbortam, Ti 15-21%, B 1-3%,

Si 2-4%, Al 1-2%, C 4.5-7.5%, f.o.b. Suspension Bridge, N. Y., freight allowed.
Ton lots per pound ..... 10.00¢

Ferroboron, 17.50% min. B, 1.50%

max. Si, 0.50% max. Al, 0.50% max. C, 1 in., x D, Ton lots... $1.20
F.o.b. Wash., Pa.; 100 lb up

10 to 14% B	.85
14 to 19% B	1.20
19% min. B	1.50

Grainal, f.o.b. Bridgeville, Pa.,

freight allowed, 100 lb and over

No. 1	$1.00
No. 6	63¢
No. 79	50¢

Manganese - Boron, 75.00% Mn,

15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd.

Ton lots	$1.46
Less ton lots	1.57

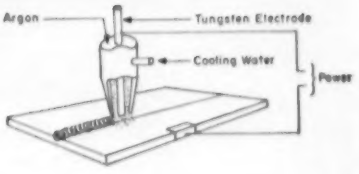
Nickel-Boron, 15-18% B, 1.00%

max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, del'd, less ton lots $2.05

Silenz, contract basis, delivered.

Ton lots ..... 45.00¢

Sound Welds in 33 Seconds ...by HELIARC Welding



Each of the six appendages of these 52S aluminum aircraft manifolds is HELIARC welded to the tubular main section in from 20 to 45 seconds . . . The spatter-free, flux-free HELIARC welds need no cleaning or finishing—costs are kept at a minimum.

The parts are aligned in a special jig, and tack-welded in position using a lightweight HELIARC HW-9 torch . . . The finished welds are made while the parts revolve on an electrically operated turntable controlled by a foot-switch. Since each weld is completed in less than a minute, production rates are high . . . Here are some of the advantages of HELIARC welding:

- Joins nearly all commercial metals including non-ferrous and high temperature alloys.
- Heat highly concentrated within the area of the weld minimizes distortion.
- Makes all type joints in all positions on metals .020 in. and thicker.
- Portable manual equipment, and semi-automatic and automatic units for all job needs . . . Semi-automatic hand-guided HELIARC welding attains speeds up to 50-in. per minute.

Start saving now—call your local LINDE representative for more information and ask for Form 7942, "Modern Methods of Joining Metals."

Linde Air Products Company
A Division of Union Carbide and Carbon Corporation
30 East 42nd Street UCC New York 17, N. Y.
Offices in Other Principal Cities
In Canada: DOMINION OXYGEN COMPANY
Division of Union Carbide Canada Limited, Toronto

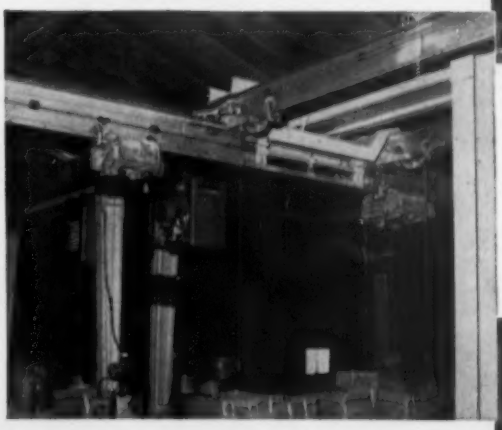
The terms "Linde" and "Heliarc" are registered trademarks of Union Carbide and Carbon Corporation.

Linde Trade-Mark

.....AMERICAN MONORAIL CRANES

for smooth operation at low maintenance cost use....

Three-ton hoist hook service extends from craneway to craneway by finger-tip controlled passage of carrier across crossover with cranes interlocked at each end.



One-ton hoist operated from crane bridge to crane bridge interlocked at crossover between craneways.

Three MonoRail cranes are interlocked to form passageway for transfer from receiving dock to steel storage area. Crane in foreground interlocks with spur track to each shear.

To handle variable loads over maximum areas, MonoRail Cranes offer smooth travel, easy movement, interlocking service between and beyond craneways, low initial cost and most important low maintenance cost. American MonoRail engineers are experienced in all phases of "up and over" handling. They are available for free consultation at your convenience.

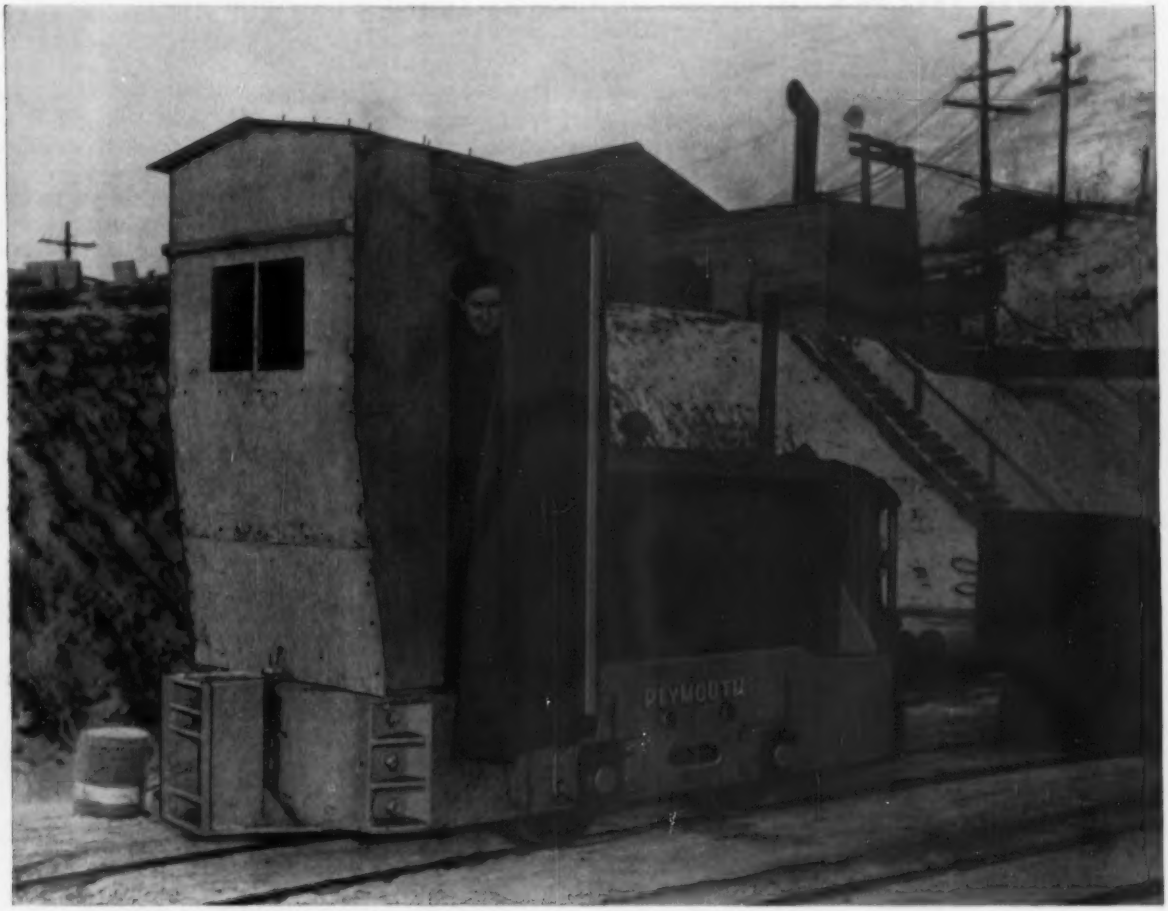
Write for C-1 Bulletin

AMERICAN OVERHEAD HANDLING EQUIPMENT

MONORAIL COMPANY

13103 ATHENS AVENUE • CLEVELAND 7, OHIO

Cold facts about Plymouth Performance



Plymouth Locomotive operates 24 hours a day in weather 30° below zero

Palmer Constructors use Plymouth's dependable performance during construction of the Bureau of Reclamation's Eklutna Water Tunnel Project in Alaska. With a homemade weatherproofed cab, the locomotive is used as an outside dinky to haul spoil rock. These operations were carried on in weather ranging down to thirty below zero. From this Alaskan frontier to the steaming tropics of Puerto Rican sugar plantations, Plymouth Locomotives assure rugged service with maximum economy. This same outstanding performance is available to you in Plymouth Locomotives from 3 to 70 tons, any gauge, gasoline or Diesel power, mechanical or Torqomotive drive. Also Diesel-electric drive. For full information write: Plymouth Locomotive Works, Dept. A-2, Plymouth, Ohio.

PLYMOUTH TORQOMOTIVES

ALSO MANUFACTURERS OF F-R-H CERAMIC MACHINERY

THE CLEARING HOUSE

News of Used and Rebuilt Machinery

See Improvement Ahead . . . Prominent southern California used machinery dealers, checked by IRON AGE, are optimistic for 1955. They see a pretty fair year, but admit they'll have to work harder to make a sale than they've had to in several years.

Inquiries will be there and buyers will have a greater selection of equipment. Dealers' salesmen will really have to push to put the sale across.

There's no special concern over reports that some manufacturers of new machinery are preparing economy lines. A few dealers say, candidly, there is a good market for the economy lines vs. overpriced used tools. But most dealers feel the competition would not be enough to hurt and that buyers still prefer a good used machine to a cheaper line of new equipment.

Supply May Dwindle . . . One factor in determining the success of the economy lines will be the supply of used machinery. Dealers today aren't too sure how the supply will hold up. There is equipment around that is fairly good, but not an adequate supply at the right price. However, they don't think equipment will be short enough to require bringing in used machinery from the East. High freight charges, they say, are pretty discouraging to buyers.

Here's the consensus of the year's outlook for various products:

Production tools should move on a replacement rather than expansion basis.

Lathes will continue in good demand this year, with some pickup likely in the small sizes. Precision type lathes will find a brisk market in southern California's growing electronics industry.

Milling machines should keep their "best seller" status.

Seek Planers . . . Planers, heavily sought last year for conversion to skin millers, will not be in such demand. The need for skin milling equipment was fairly well met in 1954.

Radial drills are expected to get a good share of inquiries.

Sheet metal equipment will be as strong or stronger than ever. Dealers are concerned that the supply may not keep pace with the need. Booming electronics and home building industries are bolstering the demand.

Need Sheet Metal Tools . . . In the housing field, dealers are already getting a lot of calls for punch presses, brakes, and shears from makers of heating, ventilating, and air-conditioning equipment, manufacturers of gutters, drainspouts, mailboxes, and cabinets.

Welding equipment should follow the same pattern as last year: good sheet metal equipment business will increase sales of smaller sized welding machines. Larger equipment, however, will still move slowly.

Used machinery business in the San Francisco Bay Area crossed the year-end finish line on the dull side despite earlier appearances of a whirlwind finish, spokesmen for the industry there told THE IRON AGE.

Bay Outlook Bright . . . But the outlook for 1955 is exceptionally bright, they say. One dealer estimates 1955 will be as much as 50 pct better than 1954. Another stuck his neck out to the tune of a 33 pct increase.

Buyers are doing quite a bit of sniffing around and inquiries are plentiful. And this is the stuff optimism is built on.

Inventories Up . . . Dealers in and around San Francisco are prepared for a surge in orders. They say they have built up their inventories and are ready, if the first quarter is as good as anticipated.

CONSIDER GOOD USED EQUIPMENT FIRST

BENDING ROLLS
8' x ⅜" Bertsch Initial Type Bending Roll—LATE
10' x ¼" Bertsch Initial Type Bending Roll
20' x 1" Hilles & Jones Pyramid Type Bending Roll

BRAKES—LEAF TYPE
8' x ¼" Dreis & Krump Size 186
10' x ⅜" Dreis & Krump Size 209
12' x ½" Dreis & Krump, Motor Driven

BRAKES—PRESS TYPE
Series 330 Cincinnati, Forming Capacity 11'0"x⅛" Model B-178 Verson All Steel, Capacity 12'x⅛"

CRANES—OVERHEAD ELECTRIC TRAVELING

5 ton P&H Trav-Lift	20' Span 220/440 A.C.
3 ton P&H Trav-Lift	22' Span 440 Volt A.C.
5 ton P&H	80' Span 220/3/60 A.C.
7½ ton Shepard-Niles	22' Span 220/3/60 A.C.
10 ton Shepard-Niles	48' Span 230 Volt D.C.
10 ton Harnischfeger	50' Span 220/3/60 A.C.
15 ton OET	45' Span 220/3/60 A.C.
15 ton Case	90' Span 230 Volt D.C.
15 ton P&H With 220/440 AC Generator Set	97' Span 115 Volt D.C.
30 ton Whiting	60' Span 230 Volt D.C.
50 ton Niles	60' Span 220/3/60 A.C.
125 ton Cleveland With 2 Trolleys 62½ ton & 10 ton Aux.	85' Span 220 Volt D.C.

CUT-OFF MACHINE
Taylor Wilson Cut-off Machine, Capacity 2⅝" to 6⅝" Complete with Hydr. System & Elect. Equip.

DRAW BENCHES
35,000 McKay Chain Draw Bench, 41' Length of Draw
100,000# Poole Draw Bench, Max. length of bar 39' With draw up to 4½" max. round

FORGING MACHINES
1", 1½" Acme
1" 7½", 6" AJAX with Air Clutch
1", 1½", 2½", 3", 3¼", 4", 5" Ajax
1½", 4", 5" National

FURNACE—ANNEALING
Lee Wilson Annealing Furnace — Natural Gas Work Dimensions 42" Coil, 96" Piling Height

FURNACES—MELTING
2 ton Whiting Hydro Arc, Top Charge
6 ton Heroult, Side Charge, with Transformer
10 ton Elec. Furnace Co. Arc Melting Furnace

HAMMERS — BOARD DROP — STEAM DROP—STEAM FORGING—800 lb. to 20,000 lb.

LEVELERS—ROLLER
54" Aetna Standard 17 Rolls 4¼" Dia.
72" H & J 8 Rolls 4½" dia.
72" Sutton, 23 Rolls 2⅜" Dia.
76" Voss-Ungerer, 23 Work Rolls 2.165" Dia. Capacity 22 to 13 Gauge Mild Steel

LEVELER—STRETCHER
150 ton Garrison No. 2 Stretcher Leveler Capacity 48" wide x 12 Ga Mild Steel

MULTISLIDE MACHINE
#35 U S Multislide Max. width of stock 4¼" by .040 thick. Edgewise Stock Straightener

PLATE DUPLICATOR
Thomas Machine Mfg. Co. Plate Duplicator, Handles Plates 6' x 18'. Punch Capacity 6" Hole through ¼" Plate

PRESSES—HYDRAULIC
100 ton Southwark 4-Column, 14" Stroke Platen 18" x 24"
150 ton United Steam Hydraulic Forging Press "C" Frame, 18" Stroke, 24" Throat
350 ton Southwark 4-Column, 36" Between Columns, 24" Stroke, 36" Daylight
500 ton Wood 4 Columns, 24" Stroke, 72" x 96" Between Columns
1200 ton Birdsboro 4-Columns, 20" Stroke 30" x 36" Between Columns

PRESSES—INCLINABLE
No. 8 Bliss OBI, 96 ton, 6" Stroke
No. 6 Bliss OBI, 56 ton, 3" Stroke

PRESS—PUNCH
200 ton Verson SI-40 Eccentric Type Single Point Suspension Press, 20" Stroke, Bed 40" x 44"

PRESSES—TRIMMING
No. 74½ Bliss 90 ton, 4" Stroke, 16½ Shut Height
No. 75½ Bliss 110 ton, 4" Stroke, 16" Shut Height

PUNCH & SHEAR COMBINATIONS
#2 Long & Allstatter Double End, Punch 1" x 1"
#5 Wickes Single End 42" Throat 1¼" x 1"
Style W Cleveland Single End, 60" Throat, 312 Ton With Attachment for Dishing Heads

ROLLING MILLS
Torrington Tandem Flattening Mill with Edge Conditioning Rolls, Flattening Rolls 8" x 4"
7½" Stecket Four High Rolling Mill
8" x 12" Blake & Johnson Single Stand Two High
10" x 14" United Three Stand Two High
12" x 16" Waterbury Farrel Temper Mill
12" x 16" Philadelphia 2-High Cold Rolling Mill
16" x 30" Lewis Two High Two Stand
20" x 36" Poole Two Stand Two High
36" Mesta 2-High Reversing Blooming Mill

SHEARS—GATE
90" x ⅛" Birdsboro
8' x ¼" Cleveland
11' x 1" Garrison

SHEARS—ANGLE
6x6x⅝" Hilles & Jones
6x6x1" Long & Allstatter Size B
8x8x1" Long & Allstatter Size C

SHEARS—ROTARY
3/16" Quickwork Rotary Shear, 36" Throat
¼" Quickwork Whiting #25A with Circle Cutting Att.
¼" Kling #250, With Flanging Attachment
⅜" Quickwork Circle Shear 18" Throat, Circle Cutting Attachment

SHEARS—SQUARING
8' x 3/16" Niagara 78B, Motor Dr. NEW 1951
10' x 3/16" Dreis & Krump, Motor Driven
12' x ⅜" Niagara, Motor Driven—LATE
72" x 12 Ga. Niagara #46-B
120" x 12 Ga. Niagara #510-B
120" x ⅛" Niagara L-10½

SLITTERS
30" Yoder Coil Slitting Line, Uncoiler & Recoiler
36" Fasson Coil & Sheet Slitter
72" Yoder Sheet Slitter

STRAIGHTENERS
No. 0 Medart Continuous Automatic Straightening Machine. Capacity ⅜" to 1⅛" Dia. Bars any length or up to 2" Tubing. Motor Driven
Kane & Roach 5-Roll Straightener, Capacity ⅜" to 1½", Belted Motor Drive
No. 2 Taylor Wilson Straightening Sizing & Burnishing Machine, Capacity ¼" to 1½" Tubing
24" Hallden Automatic Strip Straightener & Cutting Machine
48" Cleveland Punch & Shear Works Strip Straightener & Cut-off Machine

TESTING MACHINES
5,000 lb. Olsen Hydraulic LoCap Universal
2,000 lb. Riehle Model PB-2 Universal
50,000 lb. Baldwin Southwark Comp. Testing Machine
60,000 lb. Tinius Olsen Universal Hydraulic
100,000 lb. Tinius Olsen Universal 4-Screw
150,000 lb. Tinius Olsen Universal 3-Screw
200,000 lb. Tinius Olsen Chain Testing Machine

ROLLING MILLS—STEEL WORKS EQUIPMENT

1—24" BAR MILL, 3-high, 3 stands, with variable speed D.C. motor, travelling tilting tables, roller tables, saws, bloom shear, furnaces.
1—18" BAR MILL, 3-high, single stand.
1—34" & 22" x 100" PLATE MILL, 3-high, with tilting tables.
3—4-HIGH HOT STRIP MILL STANDS for up to 76" width.
3—4-HIGH HOT STRIP MILL STANDS for up to 48" width.
1—29" & 15" x 48" SHEET ROUGHING MILL, 3-high, with tables, furnace and drive.
1—12" x 16" COLD STRIP MILL, 2-high.
1—16" x 16" 3-STAND TANDEM COLD STRIP MILL.
1—10" ROD MILL, 14 passes, 2-high.
2—PACK FURNACES for hot sheet mills, 62" x 60', double chamber.
2—REELS FOR RODS, vertical pins, stripper plate, speed 72/216 RPM.
1—STRAIGHTENER for bars from 1½" to 3½" dia.
1—STRAIGHTENER for bars from ¼" to 1½" dia.
1—SCRAP BALER, box size 84" x 18" x 36".
1—1800 HP GEAR DRIVE, ratio 19 to 1.
1—1500 HP GEAR DRIVE, ratio 7.55 to 1.
1—1200 HP GEAR DRIVE, ratio 900 to 30 RPM.

1—44" ROLL LATHE, enclosed headstock, tailstock, piano rest, 20 H.P., 500/1500 RPM, 230 volts, D.C. motor and control.
1—34" x 192" ROLL GRINDER with all necessary motors and controls.
1—100,000 LB. DRAWBENCH for rods and tubes, 40 ft. draw.
1—60,000 LB. AETNA-STANDARD DRAWBENCH with 150 H.P. D.C. variable speed motor drive; motor-generator set.
1—76" BACKED-UP ROLLER LEVELLER.
1—48" BACKED-UP ROLLER LEVELLER, rolls 2½" dia., 30 H.P. drive.
1—STAMCO #6 CORRUGATING MACHINE for sheets, removable dies.
1—50-TON CRANE, 52'9" span, 10-ton auxiliary, 4 motors.
1—15-TON SOAKING PIT CRANE, 72' span, 230 volts D.C.
4—TINNING UNITS for hot dipped tin plate.
1—SHEAR for sheets, capacity 144" x ⅜".
1—SHEAR for bars up to 3½" square.
1—ROTARY SIDE TRIMMING SHEAR, capacity ⅛" x 72".
1—2000 HP MOTOR, 600 RPM, 6600/3/60.
1—1250 HP MOTOR, 593 RPM, 6600/3/60.
1—750 HP MOTOR, 180/450 RPM, 600 volts D.C.

FRANK B. FOSTER, INC.

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Late type 12" x 48" Landis Type C Universal Hydraulic Cylindrical Grinder Serial #17086.

72" Niles Bement Pond Vertical Boring and Turning Mill—Reconditioned.

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#47 Heald Single End Boromatic—Serial #4646.

DB2112-A Excello Single End Boromatic — Serial #10169.

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Numerous spare parts. This mill is offered at $18,000.00 f.o.b. Sinking Spring, Penna. A real bargain!

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Knives 29"

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13" Knives

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SLIP RING MOTORS

Constant Duty—3 phase 60 cycle

Qu.	HP	Make	Type	Volts	RPM
1	1500	G.E.	MT-468	2200	357
1	1200	G.E.	MT-34	4160/2300	300
1	1200	G.E.	MT-36	2300	277
1	700	G.E.	I-M	2300	400
1	600	Al.-Ch.	ANY	2300	514
3	500	G.E.	I-16-M	2300	450
3	400	G.E.	MT-413	2300	450
1	300	G.E.	I-17A-M	2300	600
1	250	Whse.	CW-507	440	1200
1	250	Al.-Ch.	ANY	440	720
1	250	G.E.	MT-414	2300	860
1	200	G.E.	I-17A-M	2300	450
1	150	Al.-Ch.	ANY	440	720
1	125	G.E.	MT-867	2204	1200
2	100	G.E.	I-16A-M	2300	600

SQUIRREL CAGE MOTORS

3 phase 60 cycle

Qu.	HP	Make	Type	Volts	RPM
1	600	G.E.	I-K	2300	514
1	300	Whse.	CW-890	2300	1750
1	200	Whse.	CW-873-C	2300	1160
1	200	Al.-Ch.	AR	440	580
3	125	Al.-Ch.	AR	2300	1750
1	125	Al.-Ch.	AR	2300	490
1	100	Whse.	CW-448	440	1750
1	100	G.E.	KT-585	440	870
1	100	Whse.	CW-888	2300	485
1	75	Al.-Ch.	AR	2300	690

SYNCHRONOUS MOTORS

3 phase 60 cycle

Qu.	HP	Make	PF	Volts	RPM
1	3000	Whse.	80	4800/2400	720
3	2106	G.E.	100	2300	300
3	2000	G.E.	80	2300	720
3	1750	G.E.	100	2300	3600
1	750	G.E.	80	2300	450
1	710	G.E.	80	2300/440	720
1	600	El. Machy.	80	440	1200
1	250	G.E.	80	440/220	900
1	250	G.E.	100	2300	514
1	250	Whse.	80	440	600
2	200	Whse.	80	440	1200
1	187	G.E.	80	440	720
1	150	G.E.	100	2300	900
1	150	G.E.	100	550	600
3	135	G.E.	80	4600/2300	1200
3	125	El. Machy.	100	4800/2400	900
2	100	Whse.	80	440	1800
2	100	G.E.	80	440	600

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No. 3 Baush, m.d., 20x40" head
No. 16—Foote-Burt Fixed Center, m.d.
3 spindle Rockford Gang Drill, m.d.
3 spindle 28" Cincinnati Bickford Upright Drill, m.d., No. 4 Morse Taper
4 spindle Niles-Bement-Pond, m.d., 12' rail, No. 5 Taper
No. 924 W. F. & John Barnes Vertical Drilling, Boring, Facing & Reaming Machine
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Leland & Gifford Multiple Spindle Upright Drill, m.d.

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No. 18 Canedy Otto Bench Model, m.d.
Providence Engineering Co., Model E, s.p.d.
No. 0, 1, 2, 3 Avey, belted m.d.
No. 18 Edlund, m.d., new
No. 4 Fosdick, 8" overarm, belted m.d., No. 2 Taper
1 spindle Allen, belted m.d.
2 spindle Allen, belted m.d., 8" overhang
No. 2LMS Leland-Gifford, single spindle, High Speed, m.d.
2 spindle Avey, size No. 1, type B, style VHP, m.d., 8" overhang
2 spindle Avey, No. 2, 3 belted m.d., p.f.
2 spindle #2 Leland & Gifford High Speed, 8" overhang, m.d.
3 spindle Leland & Gifford #1LMS—High Speed, late, m.d.
3 spindle Leland & Gifford High Speed Model 3MS, m.d.
4 spindle Allen High Speed, m.d.
4 spindle Leland & Gifford High Speed, m.d. on each spindle
6 spindle Leland & Gifford, m.d. on each spindle, No. 2 Taper
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Qu.	H.P.	Make	Type	Volts	RPM
1	2500	G.E.	MCF	600	600/500
1	2000	Whse.	MIII	600	230/460
1	1200	G.E.	MCF	600	750/950
1	940	Whse.	QM	250	140/170
1	900	Whse.		250	450/550
1	885	Whse.		250	85/100
1	600	Al. Ch.		250	600/800
1	500	Whse.	CC-216	600	300/900
1	500	G.E.	MCF	600	300/900
3	450	Whse.		250	415
1	400	G.E.	MCF	550	300/1050
1	300/300	G.E.	MPC	230	350/920
1	250	G.E.	MPC	230	400/800
1	200	Bal.	18T6T	230	720
1	200	Whse.	CB-5115	250	600/800
1	150	G.E.		600	858/750
1	150	Cr. Wh.	66H	230	1150
8	150	Cr. Wh.	80H-THFC	230	850
1	150	Whse.	HK-151B	230	856/1860
1	150	Whse.	HK-201	230	340/950
1	80/120	G.E.	MCF	230	350/1000
3	100	Whse.	HK-181	230	450/1000
1	100	G.E.	CDP-115	230	1750

M-G Sets—3 Ph. 60 Cy.

Qu.	K.W.	Make	RPM	D.C. Volts	A.C. Volts
2	2000/2400	G.E.	450	250/300	2300/4600
2	1750/2100	G.E.	514	250/300	2300/4600
1	2000	G.E.	300	25cy 600	11000
2	2000	G.E.	514	600	6600/13200
3	2000	G.E.	450	600	2300/4600
1	1500	G.E.	720	600	6600/13200
1	1500	C.W.	514	80/115	4000/13000
1	1000	G.E.	900	260	6600
2	1000	G.E.	720	600	2300/4600
2	750	G.E.	720	275	2300/4600
1	750	C.W.	514	80/115	2300
1	600	G.E.	720	250	440/2300

TRANSFORMERS

Qu.	KVA	Make	Type	Ph.	Voltages
1	5000	Whse.	OISC	3	2300x26400
1	5000	Whse.	OISC	3	26400/13200x460
3	3000	G.E.	HVDDJ	1	66000x13800
8	1000	G.E.	HVDDJ	1	2400x480
4	1000	Wagner	OISC	1	13200x460
3	667	G.E.	GD	1	13800x2300

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MOTORS & GENERATORS, etc.

1 YEAR GUARANTEE

Partial Listing Only!

SLIP RING MOTORS

HP	MAKE	TYPE	SPEED
600	Cr. Wh.	181A	514
2-500	G.E.	IM	450
2-450	G.E.	IEM-17B	900
400	G.E.	IM	600
350	Westg.	C.W.	450
300	Westg.	C.W.	1200
250	G.E.	IM-17A	600
200	G.E.	MTP-587	1800
3-200	Westg.	HP-155	600
150	Westg.	HP-155	600
125	G.E.	IM-15	600
100	G.E.	MT-847	1200
100	G.E.	IM	720
100	B.D.		514

SQUIRREL CAGE MOTORS

HP	MAKE	TYPE	SPEED
200	Wagner	RP2-265	1800
200	G.E.	KF-6635	900
200	Al. Ch.		900
150	Westg.	GB	1200
150	El. Machy.		1200
150	Cr. Wh.	8C-55R	1800
150	G.E.	IK-17	600
125	Cr. Wh.	8C-52R	3600
125	Al. Ch.	AR-236	1800
125	G.E.	IK	1200
100	Westg.	TEFC, CS-607S	3600
100	G.E.	KT-543	1800
100	Westg.	CS	1800
100	Westg.	CS	900

LOW & HIGH FREQUENCY A. C. GENERATORS

SIZE	MAKE	CYCLE
10 KW	G.E.	15
10 KW	G.E.	25/60
300 KW	G.E.	25/60
5 KW	G.E.	120
230 KVA	G.E.	150
154 KVA	G.E.	150
15 KW	G.E.	180
25 KW	Howell	180
50 KW	G.E.	210
5KVA	Sterling	250
7½ KW	G.E.	120

DC MOTOR DRIVEN AC GENERATORS

SIZE	MAKE	INPUT VOLTS	OUTPUT VOLTS
50 KVA	Star	115	120
50 KVA	Westg.	230	220
81 KVA	Ideal	115	440
81 KVA	El. Machy.	230	440
12½ KVA	Cr. Wh.	230	240
10 KVA	Burke	110	120
7½ KVA	Hartner	115	220
5 KW	G E	230	240
5 KVA	El. Spec.	115	110
7½ KVA	Cont.	230	120
2½ KVA	K & B	115	220

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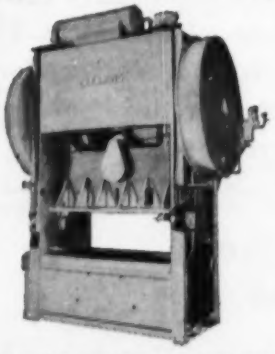

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5 inches	57.60	51.00	45.00	45.00	43.20	40.80
6 inches	65.50	61.20	54.00	54.00	51.85	48.95
8 inches	87.35	76.80	72.00	69.15	65.30	60.85
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ADVERTISERS IN THIS ISSUE

An asterisk (*) beside the name of advertiser indicates that a booklet, or other information, is offered in the advertisement. Write to the manufacturers for your copies today.

A

*Acme Steel Co. Between Pages 16 & 17
Acorn Iron & Supply Co. ... 82
Ajax Electric Co., Inc. ... 4
Ajax Electric Furnace Corp. ... 4
Ajax Electrothermic Corp. ... 4
Ajax Engineering Corp. ... 4
*Allegheny Ludlum Steel Corp. ... 54
Alliance Machine Co., The ... 31
Aluminium Limited Sales Inc. ... 27
*American Monorail Co., The ... 193
*American Non-Gran Bronze Co. 162
*American Pulverizer Co. ... 146
American Shear Knife Co. ... 152
American Steel & Wire Div., United States Steel Corp. ... 39
*American Wheelabrator & Equipment Corp. ... 60
*Arcos Corp. ... 134, 135
*Armco Steel Corp. ... 6
Armel, James P. ... 200
*Armstrong Bros. Tool Co. ... 124
*Arwood Precision Casting Corp. 86
*Atlas Car & Mfg. Co., The ... 154

B

Baker Bros., Inc. ... 194
*Baker Industrial Truck Div. of The Baker-Raulang Co. ... 8
Baldt Anchor, Chain & Forge Div. 202
Beatty Machine & Mfg. Co. ... 136
Belyea Co., Inc. ... 199
Bankart Steel & Supply Co. ... 201
Bennett Machinery Co. ... 198
Bertsch & Company ... 205
*Bethlehem Steel Co. ... 1
Birdsboro Steel Fdry. & Machine Co. ... 49
*Blanchard Machine Company, The 80
*Bliss, E. W., Co., Rolling Mill Div. ... 20, 21
Bliss & Laughlin, Inc. ... 61
Bound Brook Oil-Less Bearing Co. 123
Brainard Steel Div., Sharon Steel Corp. ... 92
*Bridgeport Brass Co. ... 22
*Brighton Screw & Mfg. Co., The 143
Bristol Brass Corp., The ... 42
Brownell, Hazard, Machine Tools, Inc. ... 198
Bucyrus-Erie Co. ... 63
*Buffalo Forge Co. ... 58
*Bullard Co., The ... 34, 35
Bullock, J. E., Co. ... 198

C

*Carlson, G. O., Inc. ... 103
Carpenter Steel Co., The ... 57
Cattie, Joseph P., & Bros. ... 206
Central Steel & Wire Co. ... 23
*Chicago Rawhide Manufacturing Co. ... 106
*Cincinnati Bickford Tool Co., The 12
*Cincinnati Shaper Co., The ... 104, 105
*Cleveland Tramrail Division, The, Cleveland Crane & Engineering Co. ... 26
*Cleveland Metal Abrasive Co. ... 145
Cleveland Steel Tool Co., The ... 206
Cold Metal Products Co., The ... 66
Colorado Fuel & Iron Corp., The, Wickwire Spencer Steel Div. ... 205
Columbia-Geneva Steel Div., United States Steel Corp. ... 39
Columbus Anvil & Forging Co., The ... 202
Columbus McKinnon Chain Corp., Chisholm-Moore Hoist Div. ... 142
Commercial Die Co. ... 202
Cone Automatic Machine Co., Inc. 165
Consolidated Railway Equipment Co. ... 200
*Continental-Diamond Fibre Co. ... 163
*Continental Steel Corp. ... 33
*Cooper Alloy Corp. ... 137
Crawford, F. H., & Co., Inc. ... 198
Crucible Steel Casting Co. ... 205
Crucible Steel Co. of America ... 127
*Cullen-Friestedt Co. ... 158
*Cutler-Hammer, Inc. ... Back Cover

D

*Dake Engine Co. ... 171
Davis Keyseater Co. ... 204
Detroit Power Screwdriver Co. ... 139
Detroit Stamping Company ... 100
*Diamond Manufacturing Co. ... 194
Donahue Steel Products Co. ... 197
Dony, D. E., Machinery Co. ... 198
Dreis & Krump Mfg. Co. ... 206
*Duraloy Co., The ... 141

E

Eastern Machine Screw Corp., The 202, 204
Eastern Machinery Co., The ... 199
*Electric Controller & Mfg. Co., The ... 40
Electric Equipment Co. ... 199
Electric Storage Battery Co., The 51
Electro Metallurgical Co., a Div. of Union Carbide & Carbon Corp. ... 53
Espen-Lucas Machine Works, The 204
Ex-Cell-O Corporation ... 174
Expert Welding Machine Co. ... 192

F

Falk Machinery Co. ... 198
Fate-Root-Heath Co. ... 195
*Federal Bearings Co., Inc. ... 38
Fellows Gear Shaper Co., The ... 90
Fenn Manufacturing Co., The ... 128
*Finkl, A., & Sons Co. ... 17
Foster, Frank B., Inc. ... 198
Frank, M. K. ... 200

G

Gem Clay Forming Co., The ... 202
General Chemical Div., Allied Chemical & Dye Corp. ... 161
General Machine Works ... 202
Goodman Electric Machinery Co. 200
Goodyear Tire & Rubber Co. ... 10
Goss & DeLeeuw Machine Co. ... 204
Gray Iron Founders Society, Inc. ... 59
Great Lakes Steel Corp. ... 83
Greenlee Bros. & Co. ... 47
Greist Manufacturing Co., The ... 203
Griffin Manufacturing Co. ... 194

H

Hannifin Corp. ... 160
*Hansen Manufacturing Co. ... 173
*Hanson-Van Winkle-Munning Co. . 62
*Haynes Stellite Company, a Div. of Union Carbide & Carbon Corp. ... 32
Hayward Company, The ... 205
Henry, A. T., & Company, Inc. ... 197
Hofmann Industries, Inc. ... 198
*Hough, Frank G., Co., The ... 44, 45
Huebel Mfg. Co., Inc. ... 202
Hughes, Arnold, Co. ... 200, 201
Hyatt Bearings Div. General Motors Corp. ... 37
Hyman, Joseph, & Sons ... 199
Hyman-Michaels Co. ... 201

I

Illiana Metal Company ... 201
Independent Engineering Co., Inc. 158
Industrial Brownhoist Corp. ... 46
*Industrial Gauges Corp. ... 36
Institute of Surplus Dealers, Inc. ... 206
International Nickel Co., Inc., The 30
Iron & Steel Products, Inc. ... 196

J

*Jaeger Machine Co., The ... 79
Jennings, Jira Thayer ... 203

(Continued on Page 206)

ADVERTISERS IN THIS ISSUE

(Continued from Page 204)

K

*Kaiser Aluminum & Chemical Sales, Inc., Industrial Service Div. 28, 29
Kaplan, M. S., Company 181
Kasle Steel Corporation 201
*Kaydon Engineering Corp., The .. 131
*Kemp, C. M., Mfg. Co., The 101
Kidde, Walter, & Co., Inc. 13
King Foundries, Inc. 202
*Kling Bros. Engineering Works .. 94
Knox, Earl E., Co. 198

L

Land, L. J., Inc. 199
*Landis Machine Co., Inc. 14, 15
Lang Machinery Co. 198
Lansing Stamping Co. 132
Larrabee, Al 198
Leland-Gifford Co. 204
*Lewis Machine Co., The 172
*Linde Air Products Co., a Div. of Union Carbide & Carbon Corp. 191
Link-Belt Co. 41
*Logan Co. 126
Luria Bros. & Co., Inc. 179

M

McKay Machine Co., The 157
MacCabe, T. B., Co. 199
*Manning, Maxwell & Moore, Inc. 138
Marshall Railway Equip. Corp. ... 201
Martin, Joe, Co., Inc., The 200
*Metalwash Machinery Corp. 11
Miles Machinery Co. 197
Mississippi Valley Equipment Co. 200
Montclair Machine & Mfg. Co. ... 202
Morgan Construction Co. 5
Morrison Railway Supply Corp. ... 201
*Mundt, Chas., & Sons 192

N

National Machinery Exchange 198
National Steel Corp. 83
National Tube Div., United States Steel Corp. 39
Naugatuck Chemical Div. of U. S. Rubber Co. ... Between Pages 48 & 49
*Nelson Stud Welding Div. of Gregory Industries, Inc. 133
New England Pressed Steel Co. ... 202
*Niagara Machine & Tool Works 18, 19
Northeastern Steel Corp. 194
*Northern Engineering Works 148
Norton Company 43

O

*O'Neil-Irwin Mfg. Co. 9
O'Neill, A. J. 201
*Oakite Products, Inc. 155
*Ohio Crankshaft Co., The 151
Olson Manufacturing Co. 202
Ornitz Equipment Corp. 200
Ottemiller, Wm. H., Co. 204

P

Penn Crane-Rail Co. 206
Perkins Machine & Gear Co. 168
Peterson Steels, Inc. 164
*Philadelphia Gear Works, Inc. ... 16
Pittsburgh Gear Co. 125
*Pittsburgh Lectromelt Furnace Corp. 96
*Platecoil Div. of Tranter Mfg., Inc. 52
Plume & Atwood Mfg. Co. 148
Plymouth Locomotive Works Div. of The Fate-Root-Heath Co. 195
*Poole Foundry & Machine Co. 192
Power Press Specialists 198
Purdy Company, The 200

R

*Ren-ite Plastics, Inc. 147
*Republic Steel Corp. 24, 25
Rockwell Engineering Co. 201
Roebling's, John A., Sons Corp. ... Between Pages 48 & 49
*Rotor Tool Company, The ... Inside Front Cover
Russell, Burdsall & Ward Bolt & Nut Co. 85
Rybiski, Maurice 199
Ryerson, Jos. T., & Son, Inc. 64

S

Saling Manufacturing Co. 203
Sandvik Steel, Inc. 166
Sessions, J. H., & Son 162
Sheldon Machine Co., Inc. 170
*Shepard Niles Crane & Hoist Corp. 159
*Silent Hoist & Crane Co. 160
*Simmons Machine Tool Corp. 152
Simonds Abrasive Co. 149
Smith, Thomas, Co. 202
Soehorger 201
Standard Iron & Steel Co. 200
*Standard Pressed Steel Co. ... Between Pages 80 & 81
Standard Tube Sales Corp. 203
Stonehouse Signs, Inc. 147
Superior Steel Corp. ... Between Pages 80 & 81

T

Tennessee Coal & Iron Div., United States Steel Corp. 39
Timken Roller Bearing Co., The ... Front Cover
*Tinnerman Products, Inc. 88
Torrington Co., The 50
Towmotor Corp. 150
*Trabon Engineering Corp. ... Inside Back Cover
Tractor & Equipment Co. 200

U

Union Carbide & Carbon Corp., Electro Metallurgical Co. 53
Union Carbide & Carbon Corp., Haynes Stellite Co. 32
Union Carbide & Carbon Corp., Linde Air Products Co. 191
*Unit Crane & Shovel Corp. 102
U. S. Rubber Co., Naugatuck Chemical Div. ... Between Pages 48 & 49
United States Steel Export Co. 39
United States Steel Corp. 39
United States Steel Supply Div., United States Steel Corp. 39
U. S. Steel Wire Spring Co., The 147

V

*Vickers, Inc. 98
Virginia Gear & Machine Corp. ... 16

W

*Wagner Electric Corp. 86
Wallack Bros. 201
Waterbury-Farrel Foundry & Machine Co. 153
Weatherly Foundry & Mfg. Co. 202
Weinstein Company 200
Weiss Steel Co., Inc. 201
Western Steel Cutting, Inc. 201
*Wheelock, Lovejoy & Co., Inc. ... 156
Wheland Co., The 132
Wickwire Spencer Steel Div., The, Colorado Fuel & Iron Corp. 205
Wilcox Forging Corp. 202
William-White & Co. 55
*Willson Products Inc. 144

Y

Youngstown Sheet & Tube Co. The 48

CLASSIFIED SECTION

Business Opportunities 203
Clearing House 196-201
Contract Manufacturing .... 202 & 203
Employment Exchange 203
Wanted 201

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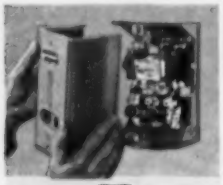

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